COMMODORE USER

Incorporating Vic Computing

Volume 1 Issue 4 January 1984 Price 85p

New Year's resolutions

Turn on, tune in

Write better programs

Join a club

POKE oftener

Save the world

Zap more droids

Get my heads straight

Get a hi-res haircut

Life sub to CU

Games — reviews and programs

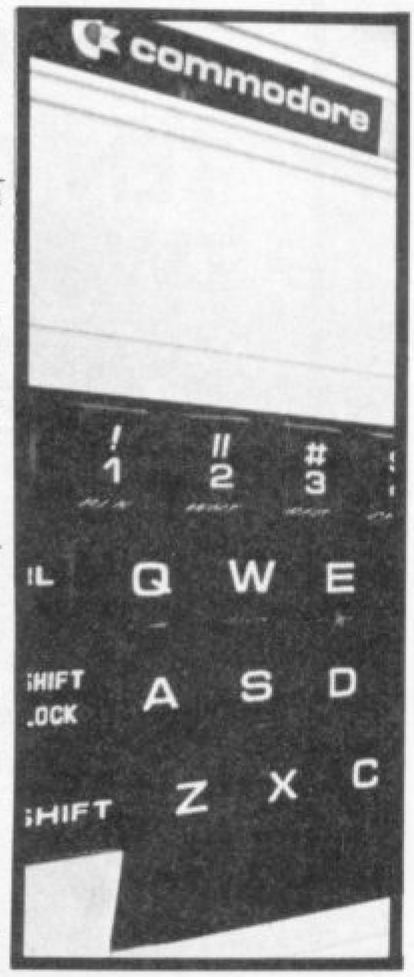
Routines return ● Butterfield back

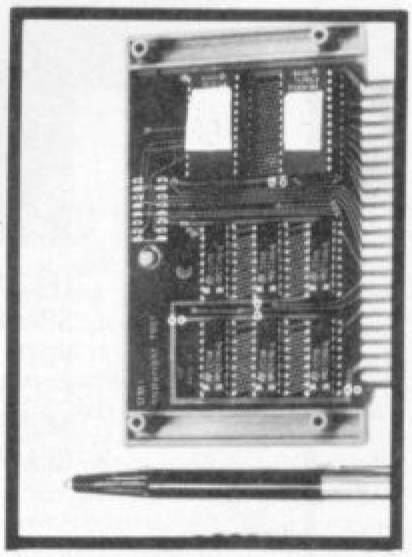
Clever cassettes ● Wordcraft's worth

HAPPY NEW YEAR SPECIAL


EXPLORE
NEW FRONTIERS OF FUN
WITH
Audiogenic
From vintage classics like "AMOK" and "ALIEN BLITZ" to the latest classics like "KAKTUS" and "MOTOR MANIA".
From Machine Code Arcade Action through Graphical Adventure to Mind Bending Board Games - WE'VE GOT THE LOT!
THE BIGGEST RANGE EVER FOR VIC 20 and 64 - NOW ALSO DRAGON AND SPECTRUM
WRITE OR PHONE FOR FREE COLOUR CATALOGUE!
AUDIOGENIC, P.O. BOX 88, READING, BERKS. (0734) 586334
STOP PRESS!
Now you can draw straight onto your screen with the new 'Koala Painter' Package — Graphics Tablet and Software. Ring or write for details.
MORE THAN JUST A GAME...

Contents









People

Editor	Dennis Jarrett
Writer	Bohdan Buciak
Editorial Assistant	Nicky Chapman
Business Manager	Annabel Hunt
Reader Services Manager	Hywel David
Subscriptions	Janet Crawford
Art/Production Editor	Paul Hulme
Production	Mike Pattenden, Maggie Underwood,
Advertising	Cathy Lane, Roland Richardson
Vicwear	Nicki

Editorial	01-241 2448
Advertising	01-241 2417
Production	01-241 2493
Administration	01-241 2354
Subscriptions Back Issues (See last page)	0732-351216

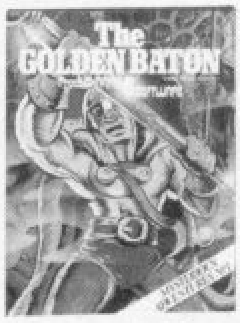
Publisher's guarantee: There are no mistakes in this magazine except this one.

CHANNEL 8 SOFTWARE

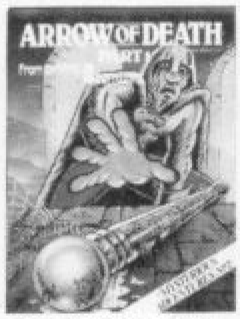
CHANNEL 8 SOFTWARE LTD. 51 FISHERGATE PRESTON LANCASHIRE PR1 8BH
TELEPHONE: (0772) 53057

TEN GRAPHIC ADVENTURES PLUS TWO ARCADE GAMES FOR THE 64

ALL AT £9.95 EACH INC VAT



VENTURE INTO SORCERY & EVIL MAGIC TO RECOVER THE GOLDEN BATON



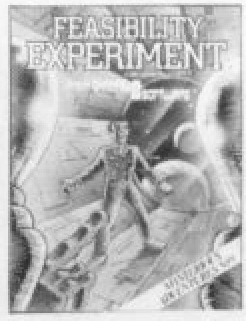
THE BATON HAS BEEN TARNISHED TRACE & DESTROY THE SOURCE OF THIS EVIL



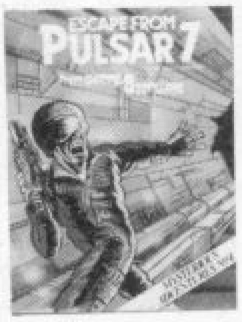
THIS SEQUAL TO PTI CAN BE PLAYED AS A STAND ALONE SCENARIO



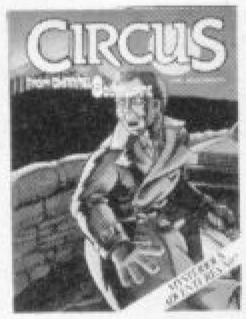
WHAT IS THE SECRET OF THE STRANGE MACHINE IN THE DESERTED HOUSE ON THE MOORS



YOU ARE CHOSEN BY A RACE OF SUPER INTELLI-GENT BEINGS TO SAVE THEIR DYING RACE



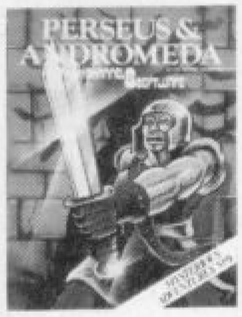
LEFT ALONE ON A SPACE FREIGHTER WITH ONLY AN ESCAPED MONSTER FOR COMPANY



OUT OF PETROL ON A LONELY ROAD YOU SEEK HELP FROM THE NEARBY CIRCUS BUT THIS IS NO ORDINARY CIRCUS.



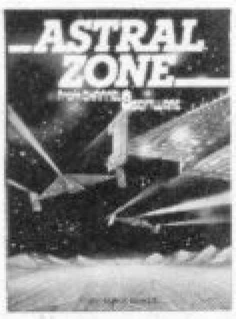
IF YOU CAN RESCUE THE KINGS DAUGHTER FROM THE EVIL WIZARD FORTUNE WILL BE YOURS... FAIL AND YOU DIE



BATTLE WITH MONSTERS AND SUPERNATURAL POWERS IN THIS CLASSIC ADVENTURE

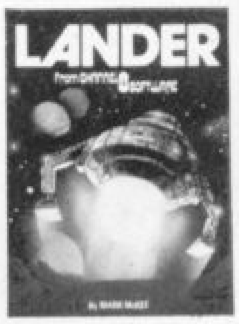


A TRAIN JOURNEY TO A STRANGE MANSION. WHAT SECRETS DO THE TEN IDOLS HOLD IF YOU LIVE LONG ENOUGH YOU MAY FIND OUT



FAST ACTION 3D MACHINE CODE SPACE SHOOT-OUT WITH SCROLLING IN ALL DIRECTIONS TRY TO SURVIVE THE WAVES OF ALIENS ZOOMING IN FROM THE DISTANT MOUNTAINS

WITH 4 SCENES AND 3 LEVELS OF DIFFICULTY THIS IS THE BEST VERSION OF THIS CLASSIC GAME. SEE IF YOU CAN EARN YOUR WINGS OR WILL YOU END UP SHIP'S COOK



ALL THE ABOVE ARE AVAILABLE ON CASSETTE IN SUPERB PACKAGING FROM MOST LEADING STOCKISTS OR DIRECT FROM

CHANNEL 8 SOFTWARE LTD ***(DEPT COM) 51 FISHERGATE PRESTON LANCS PHONE 0772 53057 24 HOUR ANSWER SERVICE***



Commodore in Scandinavia

Commodore is very strong in Scandinavia: the reason is very good marketing and extremely good software support. Of course the main machine is still the Vic-20 and it has been so successful that when the CBM 64 came along they did not dare to delete the well-known name of Vic – the big brother is named Vic-64 here.

Prices though are rather high. The Vic is about £155, the 64 is twice that – it used to be £500. As a comparison, the Spectrum 48K is £175.

Software support is very good with some really great stuff produced locally – mainly for the business/educational side of things because there are many companies importing games from the UK and USA. Among Sweden-developed software we can mention:

- **Vic Forth** (the first Forth cartridge for Vic and 64 in the world)
- **Vic Stat** (another cartridge, giving 15 new commands in the field of statistics – standard deviation, variance, diagrams and so on)
- **Vic Graf** (a cartridge for Vic and 64 which analyzes equations and shows them graphically)
- **Calc Result** and its advanced version (64 only) – claimed to be one of the more advanced of its kind and is heavily advertised in American computer magazines
- **Kalender 64** (a cartridge time manager in Swedish, also including a database with facilities for cassette/disk and printer)
- **Teledata 64** (a cartridge for dial-up access to many computer databases in Sweden and abroad)

There is also a great number of books both for the Vic and 64, and many evening schools use either machine for education.

On the hardware side the Swedes were first to release a relay box for computer-controlled switching of home appliances or other purposes (limited by fantasy only): it is called Vic-Rel. There is also a Vic-Switch, which can connect up to eight Vics or 64s to a common printer and one common disk drive.

There are also kits available to convert the Vic's (or the 64's) keyboard to the odd Swedish letters that we have, even though only three characters are replaced they decided to rearrange the board to become fully standard: thus the kit comes with eight new keys, a new kernal ROM and a new character generator, really smart! In the 64's case they tried to save money by supplying the new character generator IC only with a self-destroying program to key in to get the right character to the right key: but the heavy complaints resulted in a better kit with two ICs, just released.

In a later issue we will have a word with some people: the major supplier, Datatronic, and its subsidiary Handic so that we get a picture on what is going on now and coming in the future.

Blunder: *Apologies to reader and author for the inadvertant omission of the character tables with Mike Todd's* **Todd's Lore** *piece last issue. Since the whole article was about those tables, it was all a bit meaningless. We'll run them in full in our next issue; and incidentally it will be a bumper number ...*

Listen in: *The first computer magazine series on the air will be broadcast on BBC Radio 4 in the New Year – ten weekly programmes, regular broadcasts of programs over the air (mostly for Sinclair and BBC but they told us there'd be "some" for Commodore), and the promise of "something for everyone – software for the hobbyist, news for the businessman and surprises for those who think that computers don't affect them". Producer Trevor Taylor apparently sees the series as "fast-moving topical programmes reporting this industrial revolution as it happens" ...*

Disk deals: *Buy a Commodore 1541 disk drive before the end of April and you should get a hundred quid's worth of free software with it – six games and the word processing package Easy Script. Commodore dealers should have the special offer right now ...*

Assemble your thoughts

In previous issues of **Commodore User** there's been an ad for something called OSIRISAN – maybe it's in this one too. It's a low-cost 6502 assembler for the Vic and 64, and it looks very good.

So we were pleased to get hold of a review copy. We're putting that through its paces now and you should be able to read the results in a month or two. Meanwhile, here are some preliminary impressions.

For a start, it's available in various versions – Vic (needs 8K expansion) and 64, tape or disk (for 1540 or 1541). And the RRP is low for what you get: tape at £19.95, disk at £22.95 (that includes P&P). And the documentation is good: typed, but at least it's comprehensive and beefy (40 pages plus a summary).

More important, of course, is what you get in the package. OSIRISAN is a symbolic assember, which means you can assign and use labels (or 'symbols') for hex values, just like variable names: not all low-cost assemblers give you that.

As well as the asembler directives you get lots of helpful programming goodies – error checking, line numbering and pagination, chaining for long files, automatic symbol table generation, and a VICMON-style 'save memory' feature. You also get FREDITOR, a good-looking text editor that sounds powerful enough to qualify as a (pretty basic) word processor; it has tabs, search-and-replace, upper and lower case, line widths to 255 characters, and more. Disk versions of both come with handy DOS commands, too.

Looks good. We'll let you know; but if you can't wait, OSIRISAN's progenitor at Elmhirst Enterprises is one John Elmhirst and he's one 0452 64938.

	1983 units	1983 dollars
Commodore	37.9%	43%
Texas	21	23
Sinclair	19.7	18
Atari	9.8	9
Tandy	6.9	3

Down with Home Computers

"Home computers are not all they're cracked up to be" says Phillip Gibbs. He's the bloke with the job of getting CBS electronics (British stable-mate of US video industry giant Coleco) on to the UK's high streets. "Home computers are supposed to be the great Utopia – but in fact they're minefield of misunderstanding." Give us more, Phil!

"It's been suggested that the home-spun challenge of the personal computer has put video games toflight and that their days on this planet are numbered. I can't speak for the whole video games industry, but as far as CBS colecovision is concerned, nothing could be further from the truth. All that the home computer offers is promises and more promises. The elaborate scenario weaved by the home computer salesman is that you simply buy one of the glorified paperless adding machines with a silicon chip and conduct your entire life from a mission control centre in your kitchen or office." Oh, this is all too much. But there's more yet.

"With a simple tap of a key you can run your business, re-organise your accounts, order your groceries, answer all your correspondence, send out your Xmas cards and water the geraniums", said Gibbs. Kapow! Zap!

"In reality it takes a long hard slog to understand the complicated programming process of computers and people soon get frustrated if they're unable to achieve what the salesmen and the ad-men told them they would accomplish at the flick of a switch", he added (it says here).

"It also costs money and many of the customers who have bought home computers end up using them solely as a games-playing machine." No, really? "Doing most tasks on a home computer is of course, genuinely simpler and faster than if you did them by hand. But it still requires a geat deal of time, patience and an ability to apply your own learning curve to a maze of high technology that not everybody can grasp." As opposed, of course, to buying one of Coleco's computers for Cro Magnons.



A micro writes

A company called Microcomputer Services in London has developed a program called Speakeasy which enables the Microwriter hand-held word processor to communicate with Commodore machines.

The Microwriter's always had problems in this area because its RS232 interface is incompatible with Commodore's IEEE version.

Although Microwriter is a unique and quite sophisticated text-handling device, it doesn't have all the functions of a 'real' word processor – like search and replace. But it does enable you to 'type' using only one hand. Since the machine's only got six keys, you need to learn the key combinations that produce each letter. That may sound daunting but users claim to have reached handwriting speeds in a matter of weeks. Text appears on the Microwriter's tiny 14-character LCD screen which displays both upper and lower case; or it can be displayed on a TV screen using the optional TV interface. This comes as a separate unit.

The machine allows you to enter, sort, retrieve and print text. That's where Speakeasy comes in.

Speakeasy is claimed to let you save text on to a Commodore disk drive or print it out on a Commodore printer, with the Commodore keyboard used to send the necessary instructions. It's also possible to send files saved on disk to the Microwriter.

Speakeasy comes in two versions. The first, costing £140 or £186 plus cable, will send and receive: the other is £70 or £120 with the cable, allows the Microwriter only to send data.

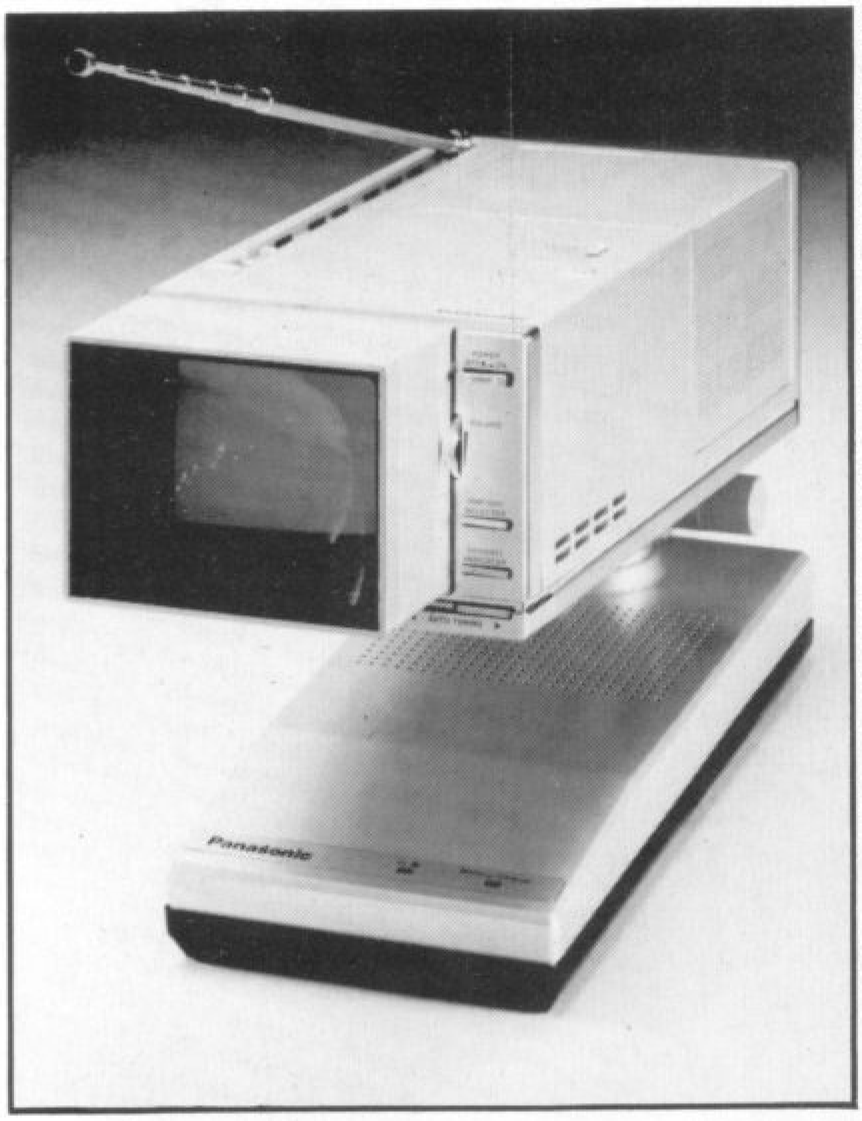
Osman Ismail, the company's software development man, reckons that demand for the package has come mainly from 8032 and 8096 users, probably most of them in business. But despite that, the company is producing a version for the Commodore 64.

There's not much demand yet for the 64 version, which is priced at £99. For that, you get the full send-and-receive. One probable advantage for 64 users is that you can buy a separate RS232 interface with conversion software for about £25, but that probably won't include the cable.

More information: 01-802 0019



INTERCEPTOR MICRO'S
4 NEW RELEASES
Our first utility program for the Commodore 64 £7.00
ASSEMBLER 64
INTERCEPTOR SOFTWARE
1021 STA $0
1021 DEX
1022 BNE
102C LDA #
1033 STA
1040 SEI
104B CLI
SUITABLE FOR THE commodore 64
An amazing new Arcade adventure on the Commodore 64 £7.00
INTERCEPTOR SOFTWARE
SIREN CITY
SUITABLE FOR THE commodore 64
A graphical adventure on the CBM 64 £7.00
TOKEN OF GHALL
A Graphical Adventure Suitable For The commodore 64
A super new idea for an Arcade game Commodore 64 £7.00
VORTEX RAIDER
SUITABLE FOR THE commodore 64
DEALERS
GIVE US A RING ON (07356) 71145 FOR A GREAT DEAL!! FANTASTIC DISCOUNTS FREE PROMOTIONAL MATERIAL AND MOST IMPORTANT OF ALL, SUPERB SOFTWARE
NAME
ADDRESS
☐ ASSEMBLER 64 (CBM 64) ☐ VORTEX RAIDER (CBM 64)
☐ TOKEN OF GHALL (CBM 64) ☐ SIREN CITY (CBM 64)
I enclose a cheque/P.O./Int. Money Order for £
Send order with payment to:–
Interceptor Micros
Lindon House
The Green
Tadley
Hants.



Nice, ain't it? Just right for sitting next to your Vic or 64 . . . This is the world's smallest, lightest 3in colour TV. It has a video-only socket, too; it comes with a mains adapter, a cable for running it off a 12v car or boat battery, carry case, and a detachable magnifying lens. The colour quality is excellent.

And now the bad news: it costs £444.50 inc VAT! Oh where are you, Sinclair?

Double-sided

Yet another company noted for vinyl rather than bytes is cashing in on the computer games market. K-tel is famed for its 'buy one, get one free' compilation albums of chart-busting, one-hit-wonder singles.

Continuing in this same well-worn groove the company is now marketing Doublesider games cassettes – you get two games for your £6.95. Initially, games for the Vic and Spectrum machines have been produced.

For the Vic 20, only two Doublesiders are available at present; there's *Supavaders/Bomber Run* and *Plague/Alien Demon* (requires 8K expansion). None of the offerings sound too inspired from the descriptions – but we haven't reviewed them yet so no more to be said at present.

Looks like the 48K Spectrum is getting the more imaginative stuff, though, with games like *It's Only Rock 'n Roll* and *Battle of the Toothpaste Tubes*. Mike Dixon, K-tel's software man, says he'd like to see them on the Commodore 64. "The deals we have with writers allows us to put games on different machines.

"We're very dependent on people sending us games for evaluation and we've got a couple of 64 games in the wings. But we're being very selective." K-tel doesn't write its own software so Dixon is hoping for a pile of games offerings to appear on his desk when K-tel's advertising campaign gets off the ground.

VIP-1

Digital Research has just announced what it describes as "an easy-to-use version" of its proprietary CP/M operating system.

CP/M is notoriously unhelpful to the user, so it looks as though the company is making amends with Personal CP/M – and it can be contained in a ROM chip (unlike CP/M itself, which is usually loaded from disk into RAM). Digital Research claims it saves loading time: operating from ROM will also make it about twice as fast. It also says Personal CP/M can be written for any type of hardware regardless of existing operating system and central processor whether it's an 8 or 16 bit chip.

What makes Personal CP/M so 'friendly', then? Paul Bailey, Digital Research's Director of European Operations says, "It simply opens up CP/M to a broader group of users, presenting its functions in a more visual and accessible style."

The visual element is being enhanced by the Visual Information Processor (VIP) which Digital Research has announced at the same time. The company describes it as 'a revolutionary new software development tool for writing software programs.

Used with personal CP/M or non-CP/M operating systems alike, it lets the programmer divide the display screen into windows. The menu window, for instance, will display only the functions you need for a particular operation. An appropriate prompt line appears at the bottom of the screen for each function selected.

Digital Research claims that with these visual and menu driven characteristics, the user won't need to open a manual. To store data on disk, for example, the disk directory is displayed visually as a block of filing cabinets, each one labelled with a file. To access a file, you select 'view' on the menu window and the pictorial filing cabinet opens to reveal pictorial folders ... and then there's pictorial paper but enough's enough.

Digital Research has just formed a Consumer Products Division to market Personal CP/M and VIP to OEM's and independent software houses. The company also intends to supply home and educational software. As Ken Harkness, the division's new general manager, puts it, "People are getting tired of zapping klingons."

He should know; he was formerly president of Atari's Arcade Division.

Personal CP/M and VIP, in short, are aimed at home users who want to do more 'serious' things with their machines.

Brian Androlia, Managing Director of ACT Pulsar, points out that he hasn't seen Personal CP/M yet: "We haven't had any detailed discussions with Digital Research about it. On the other hand he doesn't sound all that interested": "We're already offering CP/M-86 and Concurrent CP/M on the Apricot. Personal CP/M seems to be intended more for the hand-held portable machine."

Microsoft is developing an 'Interface manager' to rival VIP. This will also provide mice and windows and it can run on the Sirius or Apricot machines. Manufacturer's licences should be available by the end of the year.

Two for the price: *Audiogenic, which has taken to calling itself "the leading independent Vic-20 and Commodore 64 software house in the UK", has launched some 'dual program cassettes' – one side of the cassette for Vic, the other for 64. Thus the same cassette satisfies both Vic and 64 users, with corresponding savings in cost", says Audiogenic magnanimously. Two cassettes have initially been launched:* Cataclysm and Bonzo. *We'll let you know what we think ...*

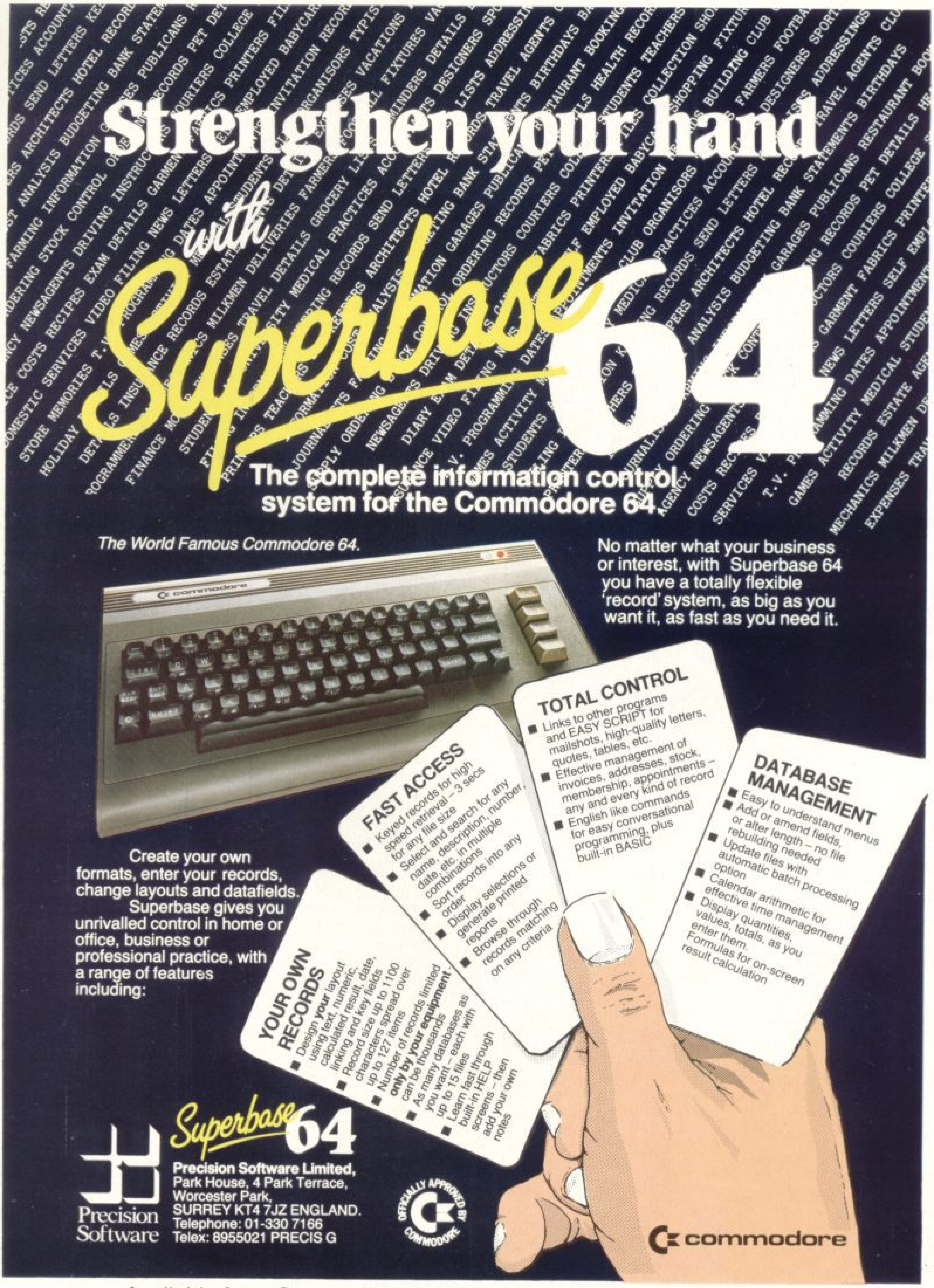
Simons' Bug: *When printing out listings using Simons' Basic, do not follow instructions in printer manual – instead type all printer commands on one line. For instance:*

OPEN 4,4: CMD4: LIST

To print more than one listing you have to **close** *all channels, switch the printer off then on again, and re-type the print instructions. If you don't use this procedure you'll get a line feed only on the printer ...*

Ask away: *CAP, one of Europe's leading information systems companies, has made what it calls "a strategic move" into the educational software market by buying a significant minority stake in Applied Systems Knowledge Ltd. ASK specialises in learning programs for schools and home-based micros, and has some good stuff for the Vic.*

CAP paid £100,000 for its 32 per cent stake in ASK and has an option to increase its holding during the next five years ...



Available from Commodore dealers and selected major retail outlets.

Screen scene

Our regular round-up of games reviews

ATTACK OF THE MUTANT CAMELS
Commodore 64
Joystick or keyboard
Price £8.50

Llamasoft is famed for fast arcade action which pushed the Vic to the limits of its capabilities. *Attack of the Mutant Camels* is one of its first CBM 64 offerings: and it continues the tradition of a skillfully-designed machine-code game requiring fast reflexes and precision joystick control.

You are the pilot of a highly manoeuverable spacecraft and your mission is to shoot at a row of six huge camels slowly trundling across a mountainous terrain. The camels are however, protected by a force field and it takes many hits at relatively close range to destroy them. As hits accumulate the camels change colour before finally disappearing in a flash of irridescence. The camels must be destroyed before they reach the end of your patrol sector, otherwise it's curtains for you! The progress of camels can be monitored on a small radar scanner.

To make life difficult – and who really wants an easy life, anyway? – the camels fire two types of bomb at you, the first of which is not too lethal (it takes four hits to kill). But the Type Two bomb homes in accurately and the first hit is deadly. Violent manoeuvres are required to avoid these hazards. If you do succeed in clearing the camels your reward is – yes, you guessed it – a trip through hyperspace to meet yet another six camels etc. etc.

The graphics and sound are good and many extra features are present such as selectable skill level, one/two player options and an even more difficult version where collision with a camel is fatal. Excellent for camel/llama freaks and arcade action enthusiasts. *JDC*

Llamasoft

Presentation:	■■■■■
Skill level:	■■■■□
Interest:	■■■■□
Value for money:	■■■■■



BALLOON RESCUE
Commodore 64
Keyboard
Price £7.95

Alligata suggests this game is suitable for six-year-olds. But why should the tiny tots have all the fun? This is a skillful and probably addictive game. You don't use the usual joystick, but three keys which control the upward and sideways movement of your fast-sinking balloon.

Your job is to pilot the balloon towards fuel canisters, picking them up so that you can proceed. There are eight cannisters, most of them in pretty inaccessible places. Graphics and sound are reasonable but the game's major plus point is the degree of sensitivity of the keys. Don't be put off by the age recommendation – there's fun here for people longer in the tooth. *BB*

Alligata Software

Presentation:	■■■□□
Skill level:	■■■■□
Interest:	■■■■□
Value for money:	■■■■□

BAT ATTACK
Commodore 64
Keyboard
Price £7.95

Nothing new or original here. Your spaceship shoots at swarms of armed bats which fire back at you. Having got rid of them, you evade a surge of flying doughnut bars (that's how the bumf describes them, anyway).

Admittedly, this game's intended for nine-year-olds: and it is pretty difficult, even at the first level. But that shouldn't trouble those of you who trained in the arcades. You use keys instead of a joystick too – makes a change. *BB*

Alligata Software

Presentation:	■■■□□
Skill level:	■■□□□
Interest:	■■□□□
Value for money:	■■□□□



BLUE MOON
Commodore 64
Joystick
Price £6.50

A well-worn scenario with a couple of extensions: spacecraft rescues sister-ship from alien planet, taking it back to safety on the Blue

We get to see a lot of games here at Commodore User, so many in fact that we can't handle all the reviewing ourselves – we farm out some of them, which is why our reviews have someone's initials at the end of them. We look at everything we get, but we don't necessarily print all the reviews we write: instead, we tend to stick with (a) all the best games we come across and (b) those games that you're most likely to find in the shops or the mail order ads.

How do we assess them? Well, basically we just play the games. Which may sound obvious, except that all the reviewers have seen so many games that they can apply a bit of comparitive experience to the evaluation.

We rate games out of five for each of four criteria. *Presentation* means how well the thing is packaged and how good it looks on the screen: dull graphics and poor sound get marked down here. *Skill level* refers to how much skill (of whatever kind) is required to play the game – so if pure chance is involved, the game gets a low mark. (But don't dismiss it on that: some 'chance' games are great fun.) *Interest* is an answer to how well the game did at maintaining the reviewer's interest in it. And *Value for Money* is obvious enough: it's our overall conclusion about how it compares with other games and whether we'd buy it ourselves.

STACK LIGHT RIFLE



Available for the SPECTRUM, VIC-20, and the COMMODORE 64, comes complete with 12 feet of cable and three exciting action software games including "HIGH NOON SHOOTOUT" with full sound effects!



With the development of the SLR comes the exciting range of software, RATS & CATS, HIGH NOON SHOOTOUT, CROW SHOOT, ESCAPE FROM ALCATRAZ, GLORIOUS TWELFTH and BIG GAME SAFARI.

The Ideal Xmas Gift!

CONTACT YOUR LOCAL DEALER OR ORDER DIRECT FROM

All this for the incredible price of only

£29.95

including V.A.T.

STACK

Computer Services Limited
290/298 Derby Road, Bootle, Merseyside L20 8LN.
Tel: Sales **051-933 5511** Service **051-933 3355**
Telex: **627026** (Stack-G)

VISA — AMERICAN EXPRESS — DINERS CLUB INTERNATIONAL

COMMODORE 64 SOFTWARE – New from the States

Title	Price
GAMES	
JUMPMAN (D)	25.50
JUMPMAN JR. (X)	25.50
ESCAPE MCP (D)	29.50
SUPERCUDA (D)	29.50
OMEGA RACE (X)	17.50
LAZARIAN (X)	17.50
LA MANS (X)	17.50
KILLERPILLER (C&D)	16.50
GORF (X)	22.50
SEA WOLF (X)	19.50
PACACUDA (C&D)	17.50
WIZARD OF WOR (X)	21.50
CANNONBALL BLITZ (X)	29.95
CROSSFIRE (T&D)	31.50
FROGGER (T&D)	30.95
MR. COOL (X)	29.95
SAMMY LIGHTFOOT (X)	30.50
THRESHOLD (X)	34.50
SHAMUS (T&D)	29.50
FT. APOCALYPSE (T&D)	32.50
REPTILIAN (T&D)	29.50
SURVIVOR (T&D)	29.50
PROTECTOR II (T&D)	29.50
DRECHS (T&D)	29.50
SENTINEL (T&D)	31.50
MORGAL (T&D)	31.50
PHARAOHS CURSE (T&D)	30.50
STAR TREK (X)	34.50
CONGO BONGO (X)	34.50
BUCK RODGERS (X)	32.50
ZEUS (T&D)	29.95
SPACE BATTLE (T&D)	17.95
SYCONS REVENGE (T&D)	17.50
ZORK I (D)	29.95
ZORK II (D)	29.95
ZORK III (D)	29.95
DEADLINE (D)	29.95
SUSPENDED (D)	29.95
WITNESS (D)	29.95
TELENGARD (T&D)	19.50
FLYING ACES (T&D)	19.50
PEGASUS ODYSSEY (T&D)	27.50
BEACH HEAD (D)	29.50
NEUTRAL ZONE (D)	29.50
CENTRAPODS (T&D)	17.50
LOGGER (T&D)	17.50
QUEST (T&D)	29.95
PROGRAMMING SERIES	
ASSEMBLER-64 (D)	24.95
C-64 SUPER EXPANDER (D)	29.95
LOGO (D)	59.95
PILOT (D)	59.95
PET EMULATOR (T&D)	24.95
MACHINE LANGUAGE MONITOR (D)	36.50
TURTLE GRAPHICS (X)	37.95
TURTLE TUTOR (X)	33.95
TURTLE TRAINER (X)	33.95
BUSINESS	
EASY SCRIPT (D)	60.00
EASY SPELL (D)	24.50
EASY MAIL (D)	19.50
EASY FINANCE, I-V (D)	ea. 24.95
CALC RESULT EASY (X)	59.95
GENERAL LEDGER (D)	49.95
ACCOUNTS RECEIVABLE (D)	49.95
ACCOUNTS PAYABLE (D)	49.95
PAYROLL/CHEQUE WRITING (D)	49.95
INVENTORY MANAGER (D)	49.95
SALES ANALYSIS MGR. (D)	49.95
DATA BASE MANAGER (D)	79.95
WORD PRO 3 + 64 (D)	67.50
HES WRITER (X)	39.95
HOME UTILITIES	
MONEY MANAGER (T&D)	29.95
ELECTRONIC CHECQUEBOOK (T&D)	29.95
PERSONAL ACCOUNTANT (T&D)	24.95
HOME INVENTORY (T&D)	19.95
COMPUTER MECHANIC (D)	24.95
ACCESSORIES	
WICO JOYSTICK ARCADE QUALITY	29.95
WICO "THE BOSS" JOYSTICK	19.95

send to
278 Warren Street
Edgewater Park N.J. 08010
Tel. 609-386-9353

DEALER INQUIRIES INVITED

for education, recreation & business

pyramid
computerware

Key: (D) Disk; (T) Tape; (X) Cartrige:

All Prices are British Pounds.



Moon (all to the strains of the original tune). This is an unashamed zapping game, but with a few differences. There are five stages; each one involves different hazards, from comet storms to the nasty Tecom. It all helps to relieve the monotony – there are 15 levels of skill too.

Despite the fire-button approach, there are a couple of stages that need skill and concentration. At the beginning you must dock the two parts of your ship before carrying on. If you reach the end, you must land on one of the three landing pads, involving three degrees of difficulty. There's a nice final touch; a flag comes up heralded by another tune. It's fun ... but maybe not rivetting. *BB*

Merlin Software

Presentation:	■■■□□
Skill level:	■■■■□
Interest:	■■□□□
Value for money:	■■■□□

First impressions of the 64

Two of our regular reviewers, Paul Roper and Wendy Greaves, have just been trying their first 64 games. This is how they reacted ...

Being proud owners of Vics and fans of many of the numerous quality games available for that machine, we were both excited at the prospect of reviewing our first batch of games for the CBM 64.

Initial impressions were mixed. The potential for better graphics is there but not all the games designers exploited it. The extra memory could be used to develop very sophisticated games with complete co-ordinate transformatives and varying aspects; but there was little evidence of this. Most games were not original, being converted versions of those available for the Vic 20 and other machines less capable than the 64.

As a result, we are not currently tempted to part with £200 for the marginal improvement in quality over Vic games – though software *is* now appearing in large quantities and the 64 must be an attractive proposition for those about to enter the world of home computing.

One word of caution: the vastly increased l;oading time for the average 64 game (possibly up by a factor of five over an unexpanded Vic game) is very tedious, and disk or cartridge versions of games may become very attractive.

Finally, a plea to games designers: the CBM 64 has two joystick ports and it is to be hoped that there will be some standardisation as to which is used for one player games. Often the instructions do not even specify which is to be used.

CALIFORNIA GOLD RUSH
Commodore 64
Keyboard
Price £7.95

This game is not particularly original in concept but is well presented and fairly entertaining. The screen depicts a maze which represents different-sized plots in a goldfield: by manoeuvering your miner around the field, fences are built – and once a plot is totally surrounded it is filled with sacks of gold and points awarded accordingly. The larger the plot surrounded, the greater is the score given. To hinder you in this task two Red Indians chase the miner, demolishing fences, scalping if they can catch him – all to the sound of distant tom-toms.

If you persevere and suceed in staking out the whole of the gold field, another maze is presented. At higher levels, more than two Indians join in the chase (maximum of five). Finally, beyond level 12 the Indians shoot arrows and the task of surviving becomes somewhat difficult to say at least. The skill level is pre-selectable, as indeed is a one player/two player option.

Sound, colour and graphics are all good for this game; and the new name of Anik Microsystems could well become established if this quality keeps up. *WG/PR*

Anik Microsystems

Presentation:	■■■■□
Skill level:	■■■□□
Interest:	■■■□□
Value for money:	■■■□□

DOTS & BOXES
Commodore 64
Joystick or keyboard
Price £6.95

An excellent chance to pit your wits against the computer! Once the program has loaded – and there's plenty of time whilst loading to make a quick cup of tea (or a vodka and tonic) – and you have read the very comprehensive instructions, the computer invites you to type in your name. Our reviewer found out why later, and is still suffering from high blood pressure when treated to a very smug message and a suggestion to take up chess after losing. The screen then displays a rectangle of dots equally spaced which have to be made into boxes. The object of the game is to make more boxes than the 64 – not as easy as you would think. A single square displayed in the bottom right corner of the screen indicates the sides of a box by numbers (8,6,4,2 for top, right side, bottom, and left side). The instruction at the top of the screen asks you which side of which square you wish to fill in. Move the joystick to the required place, and press the fire button. A line is inserted; the 64 then makes its move, and you carry on in this way until either you or the 64 are forced into a position whereby a box can be completed. Each time a box is completed its background colour changes and an initial is inserted to show who completed it.

Smug messages notwithstanding, this is a good one. The graphics are excellent, as are the instructions and the design of the program. Highly recommended for those with devious minds and determination. Not recommended for those with blood pressure problems! *WG/PR*

A.R. Al-Haddad (We would definitely appreciate hearing more from this company if they have other games of this calibre).

Presentation:	■■■■■
Skill level:	■■■■□
Interest:	■■■■□
Value for money:	■■■■□

HUSTLER
Commodore 64
Joystick or keyboard
Price £5.99

Fans of Ray Reardon and Steve Davies will enjoy this version of the popular pool arcade game. Six game variants are provided, ranging from simple potting up to two-player games such as minipool.

Six coloured balls are shown on the table plus a white cue ball. The game is played by moving a cursor with the joystick until it is situated at the point on the ball you have chosen at which you intend to aim the cue ball. The strength of the shot is adjusted by watching a moving scale and pressing the fire button at the required point.

This game is immense fun and in one reviewer's household caused fights amongst children and adults alike for possession of the joystick. The graphics and colour are superb and the sound effects are very good. The sound of a ball bouncing off the cushion is very realistic (the sound of

balls colliding could possibly be improved – a minor point really). Movement is fast and smooth but we suspect that liberties have been taken in interpreting Newton's law on linear momentum conservation (*Dictionary for breakfast again, I see – Ed*). Thoroughly recommended. *WG/PR*

Bubble Bus

Presentation:	■■■■■
Skill level:	■■■□□
Interest:	■■■■□
Value for money:	■■■■■

PURPLE TURTLES
Commodore 64
Joystick or keyboard
Price £7.95

Quicksilva games have a good reputation. and this keeps it up. Your objective is to get across the river to pick fruit on the other side. To do this you use the rare Purpilioius Tortilious as stepping stones. However, the KPT has a nasty habit of suddenly sinking to the bottom of the river when least expected, and you may consequently end up in the drink. The PT then floats back up to the surface.

Once you reach the other side of the river, you collect your fruit (which change as the skill levels go up), and then make your wary way back across by the same route. Each time you return



successfully laden, an owl in the tree behind you gobbles the fruit and squawks for more. So off you go again.

Life not being as simple as one would wish, the turtles start to sink two at a time as the skill levels go up, thus making your crossing infinitely more dangerous, and much wetter if you miss. However, there are no man-eating nasties lurking below the surface, so one must be grateful for small mercies.

This is a well thought out program with superb graphics, colour and sound. Very simple to play: but very highly recommended. *WG/PR*

Quicksilva

Presentation:	■■■■■
Skill level:	■■■■□
Interest:	■■■□□
Value for money:	■■■□□

QUINTIC WARRIOR
Commodore 64
Joystick or keyboard
Price £7.95

Space games are the most numerous of arcade-derived programs for home computers. *Quintic Warrior* is a complex game based loosely on *Space Invaders;* joystick controls



spacecraft hurtling around the screen to stem the relentless advance of multicoloured nasties. They do not shoot back, but you do have to contend with the X-Y zappers (somewhat akin to Llamasoft's *Gridrunner*) and if you get caught in the intersection of the two laser beams – Kapow!

As the game progresses additional menaces appear at the edge of the screen firing rockets at you. Confused? Then don't rely on the instructions, which are inadequate and annoyingly provided on the screen rather than on the cassette packaging. Still, the action is fast and furious, the graphics are very good and the skill level selectable. *Quintic Warrior* will definitedly appeal to space game enthusiasts. *WG/PR*

Quicksilva

Presentation:	■■■■□
Skill level:	■■■□□□
Interest:	■■■□□
Value for money:	■■■■□



SOCCER
Commodore 64
Joystick
Price £9.99

You've always known there must be something better than blow-football or Subbuteo – well, it's arrived. Commodore's Soccer is no less than a brilliant game with brilliant use of graphics, colour and remarkable player manoeuvrability.

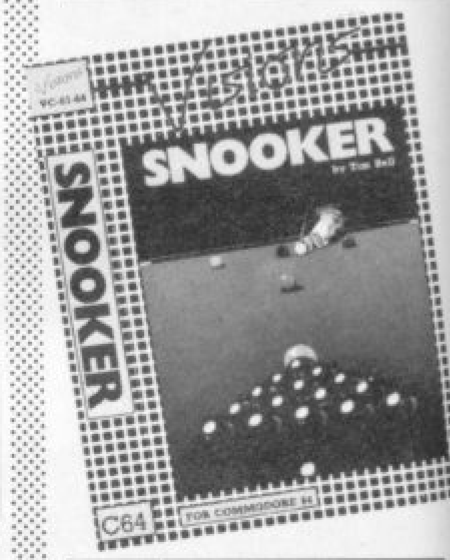
You can play an opponent or the computer itself. In this mode, there are 9 levels of difficulty. The first gives you the skills of Brazil waltzing round the likes of Accrington Stanley: in level 9 you probably won't see much of the ball at all. Of course, in playing an opponent the skill levels are eqaally matched.

Each team has about five players. But it's difficult to count them as they're constantly on the move, marking, getting into space, rushing back to help the defence – what a workrate! Only one player on each team is under joystick control; he's either on the ball or nearest to it. Pressing the button makes him kick it (he won't kick an opponent though; this is a nice clean game). When the ball's in space, the player nearest it from both teams becomes controllable – they stand out by having a lighter strip. The goalkeeper can be controlled too; he dives at the press of a button. But commit him too early and he's left sprawling and helpless like a beached whale. Great fun!

A great deal of attention has been paid to detail: both teams canter on to the field at the beginning, there's a half-time period, throw-ins, dead-ball kicks, referee's whistle. Best of all, the fans cheer when a player scores – no kissing and hugging of scorer though. And then at the end ... but that would be telling. Only one gripe, the two halves just aren't long enough and there's no facility for extra time. Great game! *BB*

Commodore

Presentation:	■■■■■
Skill level:	■■■■□
Interest:	■■■■□
Value for money:	■■■■■



SNOOKER
Commodore 64
Joystick or keyboard
Price £8.95

Even Steve Davies (who appeared at the recent launch of Visions) didn't manage a respectable shot on this game: Snooker is very realistic and consequently rather difficult. It follows the real game almost to the letter so there's no need to explain it.

Cueing is done by means of a cross which you position in the direction you want the cueball to go. Holding down the fire-button increases the power of the shot. You can use spin but you can't do trick-shots like kangerooing or bending. Progress through the colours is just like the real game. But there are a few differences: you can delete any of the balls, and the sequence of colours comes up automatically when all the reds are down.

The game shows good use of colour and sound; the background can be changed for better ball definition, and the sound of clunking balls is reasonably authentic. One gripe is the irritating jingle you hear after a pot or foul stroke.

This game's probably got lasting value if you're not put off by an initial lack of potting prowess. *BB*

Visions Software Factory

Presentation:	■■■□□
Skill level:	■■■■■
Interest:	■■■□□
Value for money:	■■■■□

Word processing road test

Wordcraft 40

by Chris Durham

Continuing our series on word processor packages for the 64

Wordcraft 40

Also called Wordcraft 64 in some promotions, this cartridge-based WP program will be well known to many people. It is directly compatible with both the 80-column and 20-column versions (for the Pet/8000 and the Vic respectively), ensuring easy transfer of documents between Commodore machines.

We reviewed Wordcraft-20 enthusiastically in the February 1983 edition of **Vic Computing**. *This version allows 26,623 characters of text in each document which is equivalent to about six pages of A4; less than I would have expected from a cartridge.*

Functions available

Wordcraft has two main modes of operation. **Command** mode is for file access, printing, merging etc and **Type** mode where you actually enter and amend text. You toggle between the two by hitting RUN/STOP; this can be done at any time.

Wordcraft 40 is loaded with functions to enable you to get the most from your word processing (as you might reasonably expect both from the price and from the author's experience with and success in WP).

You can select any width of page up to 99 columns; this gives you the option of typing across the full width of the paper or limiting the width to the screen size of 40 columns. A simple command then alters the width again before printing.

Unlike many microcomputer word processors, Wordcraft formats text on the screen *as you type* thus enabling you to set out your document exactly as it is going to be printed. And by using the CBM (Commodore logo) key in conjunction with ordinary text keys, a range of formatting commands (controls) are available. The command to centre text is **CBM** with the **minus** key, for instance, and this centres one line.

Likewise **CBM [** indicates the start of indented lines and **CBM]** switches off indentation. The CBM key is also used to gain access to a number of direct commands such as **Move**, **Search/Replace** and **Delete** for whole words and whole lines (the DEL key is also available for deleting single characters, and there's a block erase function for whole chunks as well).

There are also good TAB functions – including a decimal tab which lines up columns of figures: very rare on microcomputer WP packages.

These commands, together with the normal editing facilities of the 64, allow really fast input and easy alteration of text.

Block commands are obtained in much the same way, allowing **deletion**, **copying** and **moving** of whole chunks and **insertions** of new matter. You just mark the start and end of the block. These commands are easy to use, and they also have a number of safety features. When doing an Erase, for instance, the block is highlighted in red and you are asked to confirm it is correct before the text is lost forever. Likewise when clearing the memory; if you have not saved the text to disk first a warning is displayed. All very friendly, all very commendable.



Output

Wordcraft will link to a number of different printers and you get a good choice of print options. It is not as flexible as some WP packages though; a number of the output options are only available with an RS232 printer – Wordcraft wouldn't accept the fact that I wanted to connect a *parallel* printer to the user port with form feed and non-auto line feed.

For those printers it does accept, however, there are facilities for doing either **underlining** or **bold** printing (but not both). And you can

send **ASCII codes** to the printer for specific characters or print controls (but only in direct mode; you cannot send ASCII from within a document).

A nice feature is the ability to print any pages you like in either groups or singly; all within one command. You can also specify how many copies you want of each document. And you can print double-spaced, with an extra space between each printed line – very useful for submitting magazine articles! (*Not useful, essential – Ed.*) Another direct command enables you to switch between single sheet and continuous stationery even though you are asked to specify one of them in the initial menu selection.

Other facilities

Wordcraft makes good use of most of the features of the 64. The colours of all the main components of the screen can be altered, for instance, using CTRL and the numbers 1-8 – the only problem here is that the colour selection is not saved with the document so has to be reset each time. The function keys are also employed to good effect. No use of sound, though – audible warnings could be handy ...

There is a good **document assembly** option which allows previously-saved sections of text to be inserted into the document in memory; very useful for making up letters using standard paragraphs. There is also an automatic **mail merge** facility using 'fill points' for variable insertions within a standard letter.

The **encryption** option is an unusual one, enabling you to save a file in a coded form. Attempting to recover an encrypted document without first specifying the password results in garbage appearing on the screen; ideal for protecting sensitive documents on a common user disk in the office for example.

Disk commands seemed limited initially, but in fact the only thing you cannot do is *delete a file* from disk. There are commands to **format** a new disk and to **validate** disks or **verify** tapes: you don't have to do all that before running Wordcraft. And there's the choice to save a document as existing file name (**replace**) or as a new one (**save**) – a useful option lacking on most WP packages. Finally, you can easily **swap** between disk drives or even to tape with a simple command; **D1** will route all disk commands to device 9, for example.

The manual

The manual provided for the review was a first edition and rather poor. Not all the facilities were adequately covered and the writing was so small as to need a magnifying glass.

WORDCRAFT 40 COMMANDS

Command Mode

a,X	Send ASCII value of 'X' directly to the printer
b	Toggle keyboard 'beep' on/off
c	Select cassette as storage device
d	Select disk as storage device (+ number if reqd)
e	Turn on Encryption (follow by password)
f	Print selected records from a 'fill' document (follow by record numbers)
g	Load file (follow by filename)
j,y	Turn on right-justification
j,n	Turn off right-justification
l,N	Set page length to 'N' lines
m	Merge specified pages of file from disk/tape (follow by filename and specified pages)
n	Clear memory (ready for new document)
p	Start printrun (can be followed by page numbers and selection of either underlining or bold printing option)
r	Replace existing file (follow by filename)
s	Save new file (follow by filename)
v	Validate disk or verify tape
w,N	Set page width to 'N' columns
$	Read disk directory
"	Set page length in inches and type of stationery used
RUN/STOP	Change to type mode

Type Mode

f1	Delete word
f2	Delete remainder of line after the cursor
f3	Open insert mode
f4	Close insert mode
f5	Tab key
f6	Decimal tab key
f7	Force new line
f8	Force new page
CRSR	Normal cursor controls
INST	Insert character
DEL	Delete character
HOME	Move to top of page
CLR	Move to bottom of page
RUN/STOP	Change to COMD mode

Type mode – controls

(All preceded by the CBM key)

c	Check mode (displays format commands set)
e	Erase block
m	Move block to specified location
n	Remove a format command from text
nt	Remove a tab command
pN	Move to page 'N'
r	Repeat block at specified location
s	Search for specified string
z	Exchange all occurances of string just 'searched' for with specified replacement
=	Centre a line
(	Start underlining/emboldening (option determined when selecting printrun)
)	End underlining/emboldening
[	Start indentation
]	End indentation
# ↑	Set tab position
# ←	Clear tab position
#/	Clear all tab positions
#<	Set left margin to cursor position
#>	Set right margin to cursor position

Colour commands

CTRL 1	Complements all colours
CTRL 2	Changes the background (screen)
CTRL 3	Changes the message line at the top of the screen, the cursor and the 'highlighting colour' used for erase block function
CTRL 4	Changes the command line
CTRL 5	Changes the 'format comd' square that appears whenever you set a format command in the text
CTRL 6	Changes the border colour and the 'ruler' line where tabs etc are shown
CTRL 7	Changes the text colour
CTRL 8	Restores all colours to their original settings

Christmas prices have never been this good



Commodore 64 computer

NOW **£199.95**

Plus our 2 year guarantee

64 STARTER PACK
Commodore 64
cassette deck Intro to Basic (part 1)
Quickshot joystick
Game
ONLY **£255.00**

64 HOME/ BUSINESS PACK
Commodore 64
1541 disk drive
Box of diskettes +
FREE SOFTWARE
Easy Script and compilation of 6 games on disk ONLY **£395.00**

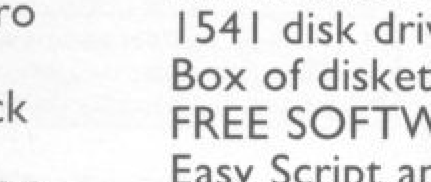
64 BUSINESS PACK
Commodore 64
1541 disk drive
MPS/801 Printer
Disks and Paper +
FREE SOFTWARE
Easy Script and compilation of 6 games on disk ONLY **£595.00**

C2N cassette deck	£39.10	MPS/801 Dot matrix printer	£195.95
1541 disk drive + FREE Software	£195.95	1526 Dot matrix printer	£295.95
1701 colour monitor	£195.95	1520 printer/plotter	£149.95
Quickshot joystick	£9.50	RX80 Dot matrix printer	£259.95
Pair of Quickshot joystick	£17.95	RX80F/T Dot matrix printer	£299.95
Introduction to Basic (part 1)	£14.50	FX80 Dot matrix printer	£399.95
Programmers Reference Guide	£9.95	FX100 Dot matrix printer	£545.95

JUKI Daisy Wheel Printer **£395.95**

commodore VIC 20

SPECIAL OFFER PACKAGE



+ C2N cassette recorder + Introduction to Basics Part 1 (Manual and 2 cassettes to take you through the first steps in computing) + 1 cassette with four games + Only from Chromasonic. FREE DUST COVER normally sold for £2.95. If purchased separately these items would cost £249.99

OUR PRICE **£134.95** **PLUS OUR 2 YEAR GUARANTEE**

16K RAM PACK **£28.95** 32K RAM PACK **£47.95**

ALL 64 PERIPHERALS, DISK DRIVES, PRINTERS, JOYSTICKS WORK WITH VIC20

MEDIA SUPPLIES

DISKETTES by Verbatim (supplied in boxes of 10)	
Single sided, Double Density, 40 Track	£17.95
Single sided, Quad Density, 80 Track	£24.75
Double sided, Quad Density, 80 Track	£32.75
Library Cases (Holds 10+)	£1.35

Plain Computer Paper	
11x8	£13.80
11x9½	£12.65
11x15⁵⁄₁₆	£15.52

Paper price is for 2000 sheets

Dust Covers	
64/VIC20	£2.95
1541	£1.95
1525	£2.95
1526	£3.95

CHROMASONIC PERSONAL COMPUTERS

48 Junction Road, Archway, London N19 5RD

TEL: 01-263 9493 or 5

We guarantee all our products for 1 year, accept 64 and Vic which is 2 years. Payment may be made by Access, Barclaycard, Bankers draft, Building Society cheque or cash. Sorry, cheques need 4 days clearance. Postage and packing:- Please allow £5 per computer, disk drive or printer, this price also covers insurance.

ALL PRICES ARE INCLUSIVE OF VAT

Review

FOR
• Formats as you type – what you see is what you get • Good range of editing facilities including block edits • Compatible with other versions of Wordcraft • Encryption facility • Allows document assembly from standard paragraphs plus mail-merge • Good use of colour
AGAINST
• No headers/footers or auto page numbering • Files cannot be deleted on disk • Price

There were eight pages devoted to connecting up and switching on, indicating that it intended to cater for the complete beginner; the rest of the manual wasn't always quite so easy to follow, but it does at least *try* to cater for the novice – which is a step in the right direction.

There is an index, but this was not as helpful as it might have been. For instance, you have to know in advance that the disk directory is called the 'Catalog', otherwise you'll never find the index entry for it.

Hopefully the next version of the manual will be rather easier to read and cover some of the features more fully.

Limitations

Some minor omissions and shortcomings are apparent with extended use. The Search option only finds the first occurence of the string on a page; it will not find the second or subsequent ones. (Though if you give the command again without a search string it will look for the last one you used.) With the exchange (Zip) option you have to exchange all occurences of the specified string; you cannot selectively change some and not others.

The restrictions on the print options mean that you may not be able to use many of the facilities available on modern printers such as super/subscript and italics. You also cannot underline and print in bold type in the same page of a document.

Importantly, and surprisingly, there is no facility for putting a heading and page number at the top (or bottom) of each printed page. Virtually all other WP packages allow this.

Conclusions

At a sneeze under £90 Wordcraft 40 is at the top-price end of the WP market for the 64. It is certainly loaded with features, as you'd expect for the price and the pedigree: yet a beginner could learn to use it without too much problem. There are one or two omissions which are surprising at this price, though, such as the lack of automatic page numbering headers: and there is no 'delete file' command.

In spite of these, Wordcraft will retain many friends and no doubt make many new ones.

Under review:	Wordcraft 40
Supplier	Audiogenic PO Box 88 Reading, RG1 1ZZ
Price:	£89.99

700 Notes

An occasional page of tips, comment and fact

Screen Line *Many people have complained about the annoying little line that appears at the bottom left hand corner of the screen. It can be very useful for indicating where the bottom line is, but if you feel that it spoils the display, there's a fix that will get rid of it.*

If you position the cursor to the 28th column on any screen line and type a reversed character, you will see a narrow line identical to the one at the bottom of the screen appear on the row above. The way to get rid of the line is to make sure that the reverse character does not appear in the 28th column. In the case of the line on the bottom row, the reverse character is on row 26 of the screen. As it is impossible to PRINT here, the correct character must be POKEd into place. This statement will do this:

```
POKE 13*4096+2028,32
```

To put the small line back just POKE in any number greater than 127.

Function keys *There are ten function keys on the 700 which when used in conjunction with the shift key can have up to 20 strings assigned to them. Keys 1-10 are given a set of definitions on power-up.*

The definitions can be changed if you require. The syntax for defining a function key is ...

```
KEY n, (string)
```

... where n is in the range 1 to 20; the string can be anything up to a maximum of 255 characters. If you add +CHR$(13) – a carriage return – to the end of the string, it will be executed in immediate mode as if it were a command.

To find out what has been assigned to each key, just type the word "KEY" followed by return and all assigned keys will be listed on the screen.

Detecting function keys from a program is not quite as straightforward as it may first appear because they don't have an ASCII code of their own. What is needed is a small piece of code that can pull the whole word from a function key. The following program will put the letter or word detected into the string B$:

```
100 B$=""
110 GETA$:IFA$="" THEN 110
120 B$=B$+A$:GETA$:IFA$<>
    "" THEN 120
130 PRINT B$
```

This of course will leave in B$ the value of any key depressed. But if a function key were pressed, the whole string assigned to that key will be returned.

Disabling the stop key *The vector that points to the STOP key detection routine is at $0314 (788). The routine that this points to returns the Z flag set if the STOP key is depressed; so the way to disable the key is to make sure that the accumulator returns from the call to this routine with any value other than zero in it.*

The best way to do this is to point the vector to the following piece of code somewhere in memory:

```
NSTOP LDA STKEY ;STKEY
                =$A9
      ORA £1    ;KILL ZERO
                RESULT
      RTS
```

Using this routine allows the program still to check for other keys excluding STOP.

If you are using Basic a pair of POKEs will point the vector to a routine at $F90B that loads the accumulator with a non-zero result:

```
POKE 788,11:POKE 789,249
```

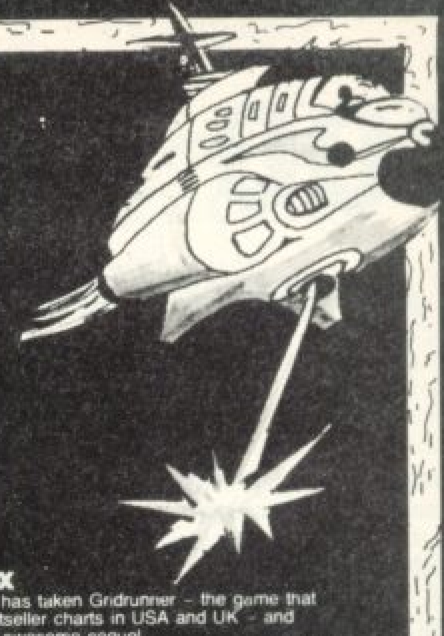




METAGALACTIC LLAMAS BATTLE AT THE EDGE OF TIME

A fast and original game for the unexpanded VIC. Challenging and colourful, with good sonics and a unique game action and design, this promises to be the most exciting new 3.5K VIC game since the introduction of GRIDRUNNER nearly a year ago. **£5.50**





LASER ZONE

Experience Laser Zone – an utterly NEW totally ORIGINAL masterpiece of Video games design. Learn to control two spaceships at once. Feel the EXHILARATION as, after long hours of practice, you control the two ships so that they function as a smooth, co-operative team! Feel the raw POWER as you lunge for the electro button and BLAST your enemies into expanding clouds of SPACE JUNK!! Feel the humiliation as a carelessly aimed BLAST slams into the side of your last remaining ship!! 8K expansion required.

Available for Commodore 64 **£7.50** and VIC-20 **£6.**

MATRIX

Jeff Minter has taken Gridrunner – the game that topped bestseller charts in USA and UK – and created an awesome sequel.
Graphically superb, it features multiple screens, new aliens and attack waves, mystery bonuses, renegade humanoids, deflexor fields, diagonal tracking, countdown/panic phase and much, much more.
Packed into 20 mind-zapping zones and accompanied by incredible sonics.
8K expansion required.
Available for Commodore 64 **£7.50** and VIC-20 **£6.**



HOVER BOVVER

A totally original arcade game for C64 featuring outstanding graphics and a sound track created by a professional Piano Wizard. Gorrdon Bennet has borrowed his neighbour's Air-Mo lawnmower. Mow your way through as many of the 16 lawns as you can before the pursuing neighbour retrieves his mower. Set your dog onto the neighbour to help you out of tight spots and don't annoy the gardener. Try not to plough through the neat flower beds or overheat your mower!

£7.50



ATTACK of the MUTANT CAMELS

Planet earth needs you! Hostile aliens have used genetic engineering to mutate camels from normally harmless beasts into 90 foot high, neutronium shielded, laser-spitting death camels!! Can you fly your tiny, manoeuvrable fighter over the mountainous landscape to weaken and destroy the camels before they invade the humans stronghold! You must withstand withering laser fire and alien UFOs. Game action stretches over 10 screen lengths and features superb scrolling, scanner 1/2 player actions and unbelievable animation! Play this game and you'll never be able to visit a zoo again without getting an itchy trigger finger! Awesome m/c action!
Available for Commodore 64 **£7.50.**



REVENGE OF THE MUTANT CAMELS

At last the long awaited sequel to Attack of the Mutant Camels is available. You are controlling a ninety foot high, neutronium shielded, lazer spitting death camel; leading a rebellion against your evil Zzyaxian overlords. The game features beautiful smooth scrolling graphics and no less than 42 different attack waves, more than any game in video history. The challenge of play will last for months as you battle to see what's on the next wave.



GRIDRUNNER

Finally true arcade quality on the unexpanded VIC! Shoot down the segmented DROIDS invading the grid. Beware of the pods and zappers! The awesome speed, sound, and graphics gives you the best blast available for unexpanded VIC. Available for VIC-20 **£5.00** Commodore 64 **£5.00** Atari 400/800 **£7.50**

All orders add 50p postage and packing

llamasoft

AWESOME GAMES SOFTWARE

49 MOUNT PLEASANT, TADLEY, HANTS. RG26 6BN. TELEPHONE: TADLEY (07356) 4478

LLAMA SOFT GAMES NOW IN BOOTS, LASKYS AND MANY OTHER RETAILERS

All-purpose MERGE *by Michael Wood*

I have successfully used the program-merging technique in the article "Program Transfers and Basic Merges" by Jim Butterfield in the June 1982 issue of *Vic Computing*. But it is unfortunately rather slow due to the necessity of transferring each program to an ASCII file on tape; and only two programs may be merged at one time, too.

I have developed an alternative 'Memory Merge' routine written in machine code which allows any number of programs to be loaded into the computer concurrently, then merged using simple SYS commands.

The merge takes typically five times longer than a screen listing of the merged programs; and with very little code alteration it can be made suitable for the Vic 20 in any memory configuration or the CBM 64 (the machine code itself occupies only 252 bytes).

'MERGE' is the generalised program from which any of the machine-specific routines can be created by substituting variables [A] to [S] with appropriate values from the table.

Prior to loading

No special action is required for the 64 or a Vic with 3K expansion *and* some more memory as well, since the code will be POKEd into the 4K area of memory starting at 49152 on the CBM 64 or the 3K unused area on the Vic.

For unexpanded Vics and those with only 3K extra, the top of memory must be lowered by POKE 51,0: POKE 55,0: POKE 52,29: POKE 56,29: CLR.

For a Vic with any expansion *apart* from 3K, raise the start of Basic by POKE 44,19: POKE 4864,0: NEW.

Load the appropriate program and RUN. The machine code will be poked into the correct area of memory, and the three important PRELOAD / MERGE / RESET addresses will be displayed on the screen.

Now load the Basic program into which the other(s) are to be merged: SYS to the PRELOAD address and the screen will clear except for two READY statements. The first program to be merged may now be loaded in the normal way – the preload instruction will have protected the other one in memory.

As many additional merge programs as required can be loaded, provided that each one is preceded by a SYS to the preload address. They can also be listed, renumbered, or otherwise modified after loading, if required.

Merging is initiated by a SYS to the MERGE address. The screen will clear then the program lines will appear, one by one, as they are merged into the original program. When finished, you get a clear screen apart from one ready statement; the fully merged program can now be listed, saved, run etc.

Further merges may be done at any time provided that the machine code program is left intact in memory. If the random number generator has been accessed in the meantime, however, it will be necessary to SYS to the RESET address first to initialise several variables used on zero page.

Method of operation

As indicated above, the first program is loaded into memory in the normal way. The PRELOAD command shifts the start of Basic to an address directly above the existing program and executes a 'NEW' to set up the new area of Basic correctly, thereby enabling another program to be loaded. PRELOAD can be repeated as many times as required, enabling several programs to be loaded (within the constraints of available memory).

The MERGE command sets the start of Basic to the first line of the program to be merged, and it then replaces the link address of the next line by zero. The program now temporarily ends after poking 'LIST' and 'SYS' commands to the screen and filling the keyboard buffer with an appropriate number of carriage returns, thereby causing a single line to be listed and the program to be restarted.

Basic is now restored to its original position and the program halts once more after again poking values into the keyboard buffer as necessary. This causes the displayed line to be accepted into the original program as though it had just been typed in at the keyboard.

Finally the program restarts, restores the link address, then repeats the process for each subsequent line until the Basic programs are merged.

Use these values when you enter the program:

Machine type	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
64	49152	192	80	4	81	82	184	5	185	52
Vic + 3K	7424	29	44	30	45	46	242	30	243	55
Vic expanded	4608	18	44	16	45	46	242	16	243	52
Vic + 3K + more	1024	4	44	16	45	46	242	16	243	49

	(K)	(L)	(M)	(N)	(O)	(P)	(Q)	(R)	(S)
64	186	57	187	50	188	50	189	49	190
Vic + 3K	244	52	245	57	246	51	247	32	248
Vic expanded	244	54	245	55	246	55	247	32	248
Vic + 3 + more	244	48	245	57	246	51	247	32	248

Notes

1. Addresses 247-250 on zero page are used by the M/C code program as temporary storage locations. This should not normally cause problems unless RS-232 processing is also required.
2. A maximum of 80 characters (CBM 64) or 88 characters (Vic-20) only per line can be transferred by this procedure. Although longer lines are accepted, the excess characters will be omitted in the merged program. However, I do not consider this to be a significant drawback since very few programs contain such excessively long lines.
3. Where the same line number is duplicated in two or more programs, the latest loaded will be transferred into the final merged program.

```
100 S=[A]
110 FOR X=0 TO 251
120 READ A
130 POKE S+X,A
140 NEXT
150 SYS(S+241)
160 PRINT "[CLR][CUD] PRELOAD : SYS" + STR$(S)
170 PRINT " MERGE   : SYS" + STR$(S+69)
180 PRINT " RESET   : SYS" + STR$(S+241)
1000 DATA 165,45,166,46,164,141,208,18,133,247
1010 DATA 134,248,200,132,141,164,43,132,253,164
1020 DATA 44,132,254,76,32,[B],56,233,2,176
1030 DATA 1,202,133,43,134,44,169,147,32,210
1040 DATA 255,169,14,141,[C],[D],169,5,141,[E]
1050 DATA [D],169,23,141,[F],[D],160,1,132,198
1060 DATA 169,13,153,118,2,136,208,250,96,164
1070 DATA 142,208,11,165,247,133,45,165,248,133
1080 DATA 46,200,132,142,164,143,208,94,177,247
1090 DATA 133,249,200,177,247,133,250,208,3,76
1100 DATA 236,[B],165,247,133,43,165,248,133,44
1110 DATA 177,249,133,252,136,177,249,133,251,152
1120 DATA 145,249,200,145,249,132,143,169,147,32
1130 DATA 210,255,169,12,141,[C],[D],169,73,141
1140 DATA [E],[D],169,19,141,[G],[H],169,89,141
1150 DATA [I],[H],169,[J],141,[K],[H],169,[L],141
1160 DATA [M],[H],169,[N],141,[O],[H],169,[P],141
1170 DATA [Q],[H],169,[R],141,[S],[H],160,7,76
1180 DATA 58,[B],165,253,133,43,165,254,133,44
1190 DATA 160,0,132,143,165,251,145,249,200,165
1200 DATA 252,145,249,165,249,133,247,165,250,133
1210 DATA 248,169,19,32,210,255,160,10,32,58
1220 DATA [B],169,17,141,119,2,141,122,2,141
1230 DATA 123,2,141,124,2,96,169,147,32,210
1240 DATA 255,160,0,132,198,132,141,132,142,132
1250 DATA 143,96
```

Mixing Machine Code And Basic

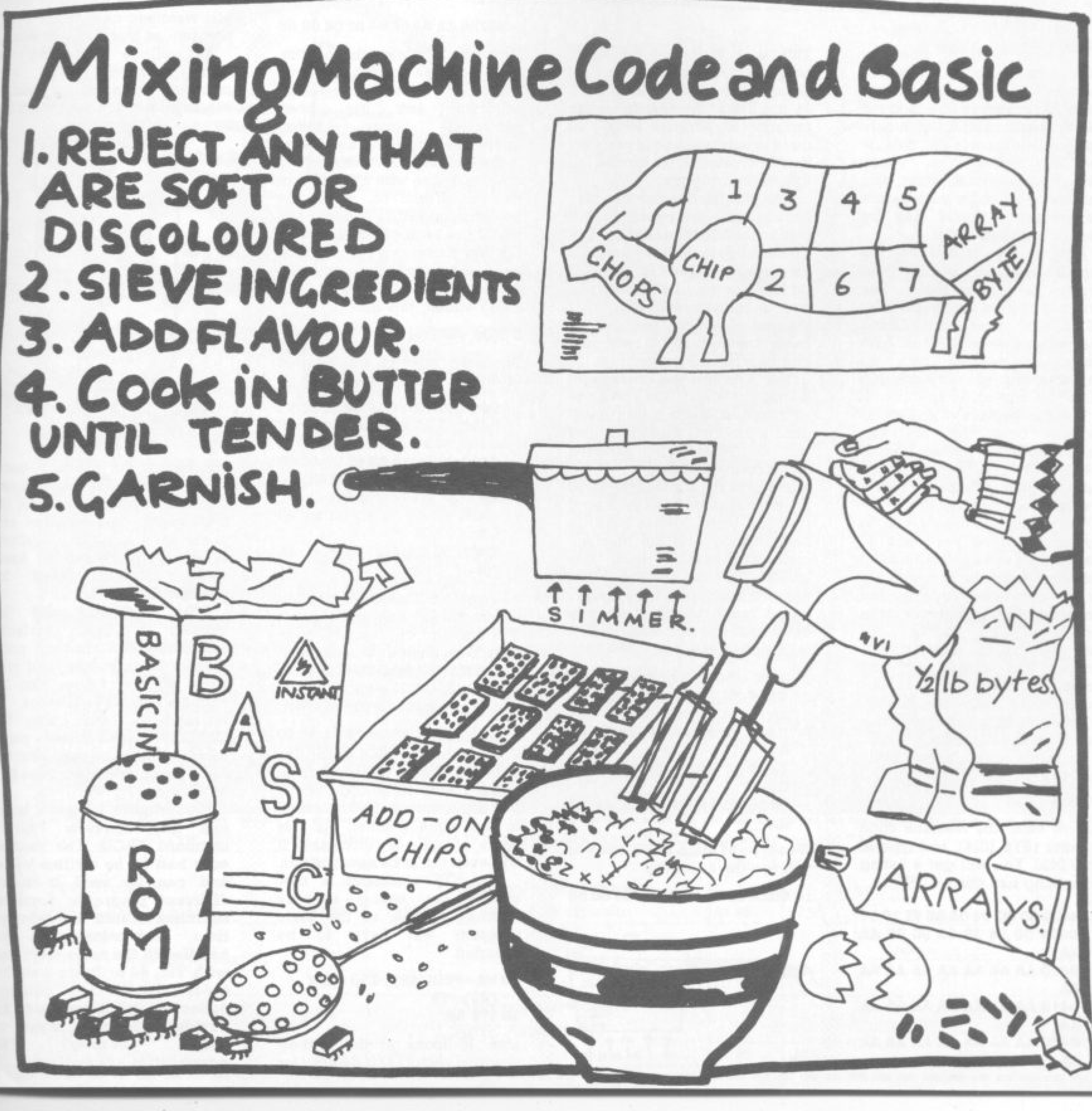
by Jonathan Turpin

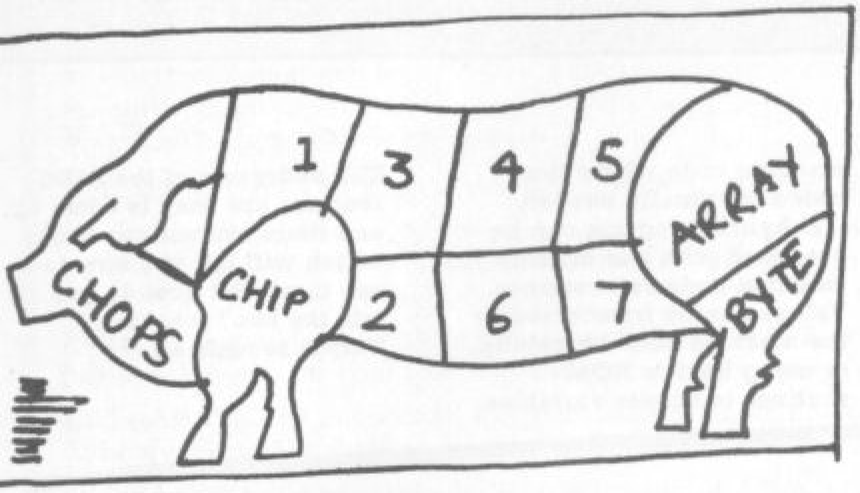
One of the problems with Basic has always been the speed of execution of programs (or lack of it). If the program you're writing needs to run quickly, you will have to resort to machine code.

Writing a long program in assembly language is not the most pleasant of tasks: there are none of the input and output commands, arrays, or even variables that make Basic so simple to use. The obvious answer is to mix the two – use Basic for the trimmings, and write in machine code where the speed is actually needed.

A hybrid program can be produced with one or more machine-code sub-routines. Values can be transferred to the machine code by poking, or using Basic's ROM routines to access variables.

The addresses of the ROM routines are easy to come by, and there are various books which will tell you how to use them. But how do you mix the two? Jonathan Turpin reveals all.





The main problem: where to store the hybrid code in memory? On the original Pets there was always the second casette buffer, and for disk-only applications there is also the first cassette buffer. This space though is often too short, and some add-on chips such as the Programmer's Toolkit use the second cassette buffer.

Another idea is to lower the top of memory pointer and reserve an area there. The drawbacks here are catering for all memory sizes, and POKing the machine code in – the DATA statements needed take up valuable memory, and reading them can take a fair time.

The Vic and 64 have no second cassette bufer, and an even greater ability to confuse people with their infinite number of memory configurations. There's a solution, fortunately.

The technique I now use to overcome these problems is very simple and applicable to all these machines, though with Vic or 64 a monitor cartridge or program will help. To explain the principle I will use a short program which fills a Pet's screen four times with the complete character set. The program is fully relocatable, which will help later, and can easily be seen to work.

Type in this short Basic program:

10 SYS 1040

Now enter the machine code monitor (SYS 1024), and type M 0400 0420. You will get a listing something like this:

```
.: 0400 00 0C 04 0A 00 9E 20 31
.: 0408 30 34 30 00 00 00 AA AA
.: 0410 AA AA AA AA AA AA AA AA
.: 0418 AA AA AA AA AA AA AA AA
.: 0420 AA AA AA AA AA AA AA AA
```

This is a listing of the Basic program in memory. The first '00' should always be left as it is '0C 04' is a link to the next line in the program at address $040C: as there is only one line of program $040C contains '00 00' to mark the end of the program.

'0A 00' is the line number 10 in hexadecimal (low byte first). '9E' is the token (condensed form of a command) for SYS. '20' is ASCII for a space, '31 30 34 30' is ASCII for 1040 (ignore all the threes and you can actually read 1040). '00' is the end-of-line marker; and we have reached $040C with the end-of-program marker.

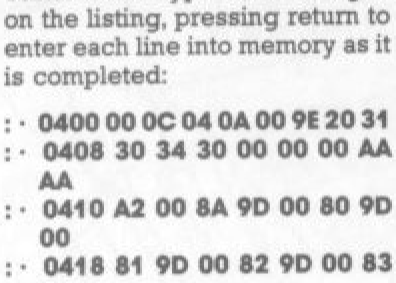
The AAs are the contents of memory when the Pet is switched on. If you have already used a program, these locations will be filled with assorted unimportant values.

It is here at the end of the Basic program that we wish to put our machine code. 1040 is $0410 in hexadecimal, and the machine code will reside from this location onwards. Use the screen editor to overtype these changes on the listing, pressing return to enter each line into memory as it is completed:

```
:. 0400 00 0C 04 0A 00 9E 20 31
:. 0408 30 34 30 00 00 00 AA AA
:. 0410 A2 00 8A 9D 00 80 9D 00
:. 0418 81 9D 00 82 9D 00 83 CA
:. 0420 D0 F0 60 AA AA AA AA AA
```

Now type **M 002A 002B,** and you will see the following:

```
:. 002A 0E 04 0E 04 0E 04 00 80
```



We are only interested in the first two bytes, locations $2A and $2B. These contain a pointer to the end of the Basic program, and also to the beginning of variable storage. The pointer is to location $040E. Looking at the previous listing you will see that this is the byte after the zeros marking the end of the program.

We now change this pointer so that it points to the byte after the last byte of the machine language. Overtype the following changes and press return:

```
:. 002A 23 04 0E 04 0E 04 00 80
```

Now type **X** to leave the monitor. The machine code is firmly attached to the end of the Basic program, and has been protected from being overwritten by Basic's program in the ordinary way. The machine code will save with it. If you turn the Pet off and on, reload the program, and RUN it, it will still work. You have no problem with DATA statements or loaders, and the minimum possible memory has been used.

Try adding this line:

5 REM SCREEN FILL

Enter the monitor and type M 0400 0430; you will see this –

```
:. 0400 00 13 04 05 00 8F 20 53
:. 0408 43 52 45 45 4E 20 46 49
:. 0410 4C 4C 00 1E 04 0A 00 9E
:. 0418 20 31 30 34 30 00 00 00
:. 0420 AA AA A2 00 8A 9D 00 80
:. 0428 9D 00 81 9D 00 82 9D 00
:. 0430 83 CA D0 F0 60 AA AA AA
```

The new line has been inserted before the SYS line, and both the SYS line and the machine code have been shifted up in memory. The machine code is still intact at location $0422. If we look at the end of program vector we see:

```
:. 002A 35 04 35 04 35 04 00 80
```

The pointer is to $0435, still the byte after the end of the machine code. The machine code is still protected, and can still be saved in the same manner. As this piece of code is relocatable it will even run in its new position.

The SYS command is now calling the wrong memory address, though, so the Basic program will have to be changed.

```
10 ML=PEEK(42)+256 PEEK
   (43)−19
20 SYS ML
```

Line 10 looks at the end-of-program vector (42 is decimal for $2A) and calculates where the start address of the machine code is. Line 20 executes it. No matter how many lines you add to the Basic program, the machine-code program will still run with this SYS.

So if you have a non-relocatable machine code program you can write the Basic program and add the machine code when the program is totally finished. In this way it will always remain in the same position.

If the machine code is relocatable, you can add it when you want and change the Basic program as much as you want.

As well as calculating the calling address, you can calculate positions for poking values into: space can be left for



this before the machine code. The machine code can also use the end-of-program vector to find where these values are. There are also various locations in zero page unused by Basic which can be used for transferring values.

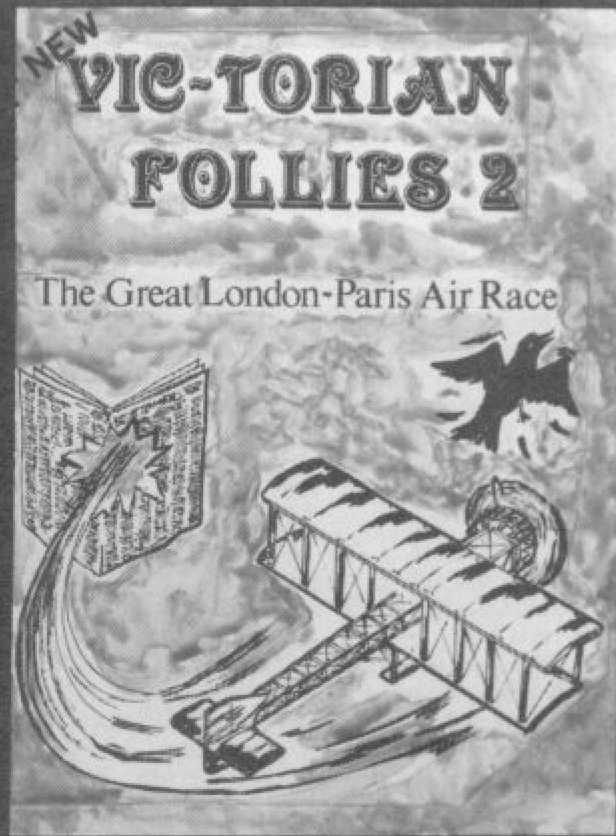
ROM routines exist for locating a Basic variable, converting the floating point number to an integer, and vice versa so that values can be extracted from variables, or returned to them. Using the CHRGET routine in zero page, values can also be read from the Basic program following the SYS command.

A routine that I use a lot is one that converts Pet to standard ASCII. The routine only had to be written once, and can be used in many different programs. Sorts or searches which are always time consuming can be handled in the same way; and with Vic, 64 or Basic 2 on the older Pets the garbage collection problem can be avoided. Special input or output routines? The possibilities are endless . . . ●

NOVASOFT

EXPLOSIVE SOFTWARE
For Vic-20 And Commodore 64





VIC-TORIAN FOLLIES ADVENTURE 1 – SEAQUEST
FOR VIC-20 + 16K EXPANSION
An exciting full colour, multi-screen graphic adventure, set in a romantic era when the foolhardy gentry would risk all, probing the depths for treasure against ridiculous odds.
The ultimate deep sea frolic complete with "Save to Tape" option
Cassette version only £6.95. Disk version only £7.95

VIC-TORIAN FOLLIES ADVENTURE II – THE GREAT LONDON TO PARIS AIR RACE
FOR THE VIC-20 + 16K EXPANSION
A unique opportunity for any Victorian gentleman to defy gravity in a Boffin built contraption where safety and air-worthiness were mere afterthoughts and the chance to prove British superiority over a host of very bizarre competitors. Racing 225 miles of rolling land and sea, aided only by your cockpit display and skill at the joystick you negotiate the most unbelievable hazards.
Probably the best graphics seen on the VIC 20 complete with Victorian newspaper featuring the great event.
Cassette versions only £6.95. Disk versions only £7.95. (available soon for the Commodore 64)

DUNGEON DROID – For Vic 20 unexpanded CASSETTE VERSIONS ONLY £5.50 DISK VERSIONS ONLY £7.95

CYCLOTRON – Fight at the speed of light – A devastating death duel! For the unexpanded VIC 20. together on one tape or disk. CASSETTE VERSIONS ONLY £4.95

JIGSAW – Assembler for VIC 20 + 8K expansion and Commodore 64, together on one tape or disk (details sent on request).
SPECIAL OFFER – CASSETTE VERSIONS ONLY £5.95 DISK VERSIONS ONLY £7.95.

JUGGERNAUT – The memory mover and MIRAGE - The memory reconfigurator. Both for VIC 20 (any memory size – details sent on request) Normally £5.95 each.

THIS MONTH ONLY – BOTH FOR ONLY £5.95

NOVASOFT – 46 PHEASANT DRIVE, DOWNLEY, HIGH WYCOMBE, BUCKS HP13 5JL (All prices include P&P)

	TAPE	DISK		TAPE	DISK	
Vic-torian Follies – II			Vic-torian Follies – Seaquest			Name
For VIC 20 + 16K expansion	£6.95	£7.95	For VIC 20 + 16K expansion	£6.95	£7.95	
Jigsaw Assembler			Dungeon Droid			Address
For VIC 20 + 8K and Commodore 64			For VIC 20 unexpanded			
on same tape or disk	£5.95	£7.95		£5.50	£7.95	
Special VIC 20 offer			Cyclotron (Lazercycles)			
Juggernaut and Mirage			For VIC 20 unexpanded			
For the price of one	£5.95	N/A		£4.95	N/A	

Split the Vic's screen

by Rae West

Split-screen means the TV is divided horizontally; the top half has different contents – different colours, graphics rather than text – compared with the bottom half. Commodore 64s, BBC micros and others can get this sort of effect; but not the Vic-20 ... until now! This previously unpublished technique is one of many "novel and exciting techniques" in Rae's forthcoming *Programming the Vic-20* (published by Level Ltd at about £11.95 soon).

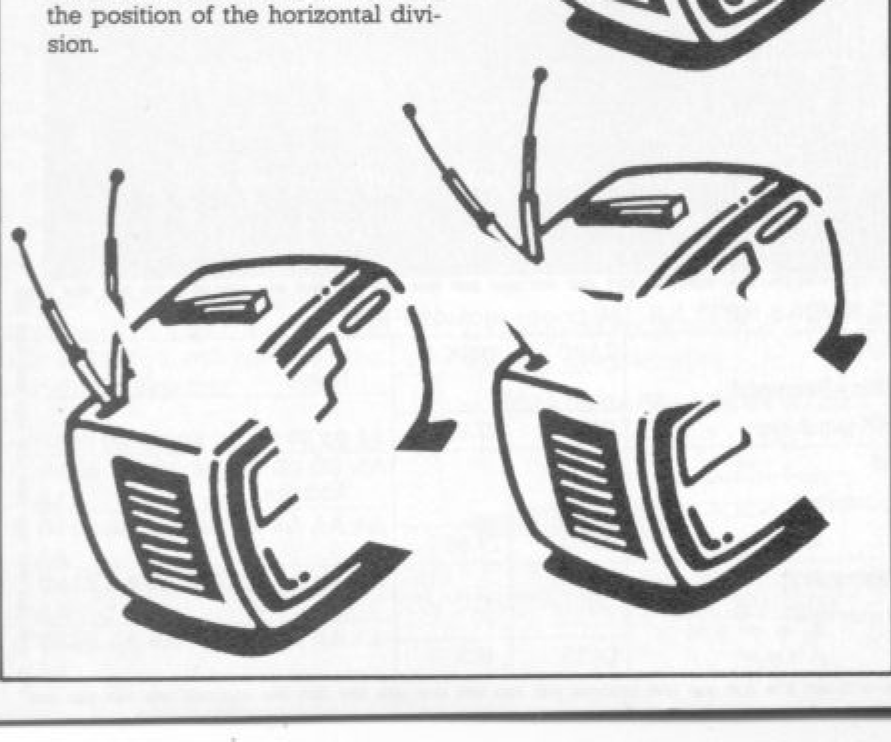
Enter the program, and SAVE it. When RUN, machine-language is poked into the tape buffer (where it is secure against interference). Line 2 initialises the machine-language sequence, which from then on operates continuously in a user-transparent way (this means that Basic runs as usual).

Its effect is to alter those Vic locations which control the screen border and background colours in each half of the screen. You can, in fact, select other combinations for yourself; try poking 876 to change the top half, 889 the bottom half. If you poke the same values, the screen will appear indistinguishable from its usual self.

(Remember that the 'reverse bit' is present in the Vic register, so POKE numbers of the type *8+border+16×background* to avoid characters showing in reverse on the screen). POKE 869 to change the position of the horizontal division.

```
1  FOR J+828 TO 895: READ X:
   POKE J,X: NEXT
2  SYS 828
5  PRINT "[CLR]POKE 869 CONTROLS POSITION OF SPLIT;
6  PRINT "POKE 876 AND POKE 889 CONTROL BACKGROUNDS AND BORDERS
10 DATA 173,4,144,208,251,169,43,141.
20 DATA 37,145,169,66,141,36,145,169
30 DATA 1,141,94,3,120,169,3,141,21,3,169,93
40 DATA 141,20,3,88,96,162,0,240,18,206,94,3,169,78,205,4,144
50 DATA 208,251,169,170,141,15,144,76,21,235,169,1,141,94,3,169
60 DATA 153,141,15,144,76,191,234
```





Screen dump

by Albert van Aardt

64

In the manual with the Commodore Printer, there is a little program that is supposed to provide printout of whatever's on the screen. The idea is that you use it as a subroutine to dump a low-res screen. I couldn't get the thing to work, so I wrote a small routine myself.



It will dump any low-res screen, which means one that uses the 'normal' keyboard characters. It is slightly slow; but I have found it very valuable for printing graphic screens, for example bar charts. It is also handy for the type of program where you have output to the screen of a particular table, and want to print this.

The routine starts at line 10000, but you can obviously change that. I've used funny variable names, so it should not create problems with your program variables.

This is the typical way to use it:

```
   70 PRINT "PRESS 'P' FOR A PRINT"
   80 GET P$: IF P$<>"P" THEN 80
   90 GOSUB 1000 100 END
10000 AZ$="":OPEN4,4:LZ=1024:FOR LZ=LZ TO 2023 STEP 40:FOR IZ=LZ TO
      LZ+39:ZZ=PEEK(IZ)
10020 IF ZZ<96 AND ZZ>63 THEN ZZ=ZZ+32: GOTO 10040
10025 IF ZZ<32 THEN ZZ=ZZ +64: GOTO 10040
10030 IF ZZ<128 AND ZZ>96 THEN ZZ=ZZ+64
10040 ZZ$=CHR$(ZZ): AZ$=AZ$
      +ZZ$: NEXT IZ
10050 IF AZ$=" (40 character spaces here) "THEN PRINT #4, "": GOTO 10060
10055 PRINT#4,AZ$
10060 AZ$="": NEXT LZ: RETURN
```

Line 10050 checks to see if the output line is equal to 40 spaces; you can leave it out, as it is only there to speed up the printing a bit.

You can of course change the variables used:

- LZ= counter to keep track of screen position.
- IZ= counter to keep track of character on screen.
- ZZ= ASCII code of screen character.
- ZZ$= Print character equal to screen character.
- AZ$= Print character string to be printed.

Because the routine is so crunched (you'll only use lines 10000 to 10060) I have found the quickest way to use it is like this:

- LOAD the subroutine
- LIST it (it will fit comfortably on the screen)
- LOAD the program from which you want to use the routine
- Take the cursor up to line 10000 of the subroutine (which will still be on the screen)
- Press 'ENTER' until the whole subroutine has been entered
- Now SAVE the program as normal, obviously after you have added the lines to use the routine (like lines 70-90 above).

ANIK gives you more games to play... for a package you can pay!

FLASH! BUY 6 GAMES and SAVE £4 Games at £3.95 each

GAMES FOR COMMODORE 64, DRAGON, SPECTRUM,

Just look at our range . . . and prices! and do not forget, only 3 games are at £7.95 each inclusive of post & packing, all other games are priced at the amazing low price of £3.95! all inclusive.
Buy any 6 games for the Very Special Price of £19.95 inclusive of post & packing.



HOW-DE-DO PARDNERS?

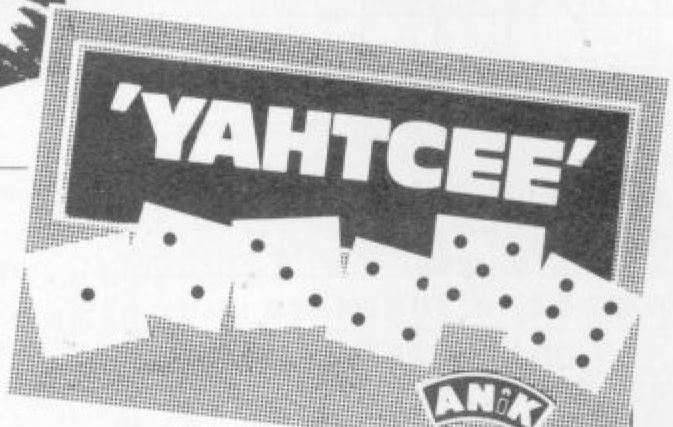
YEP FOLKS — IT'S HERE "CALIFORNIA GOLD RUSH"

This here's Prospector Jake, I sure am havin' one helluva time tryin' to peg ma claim with those damned Injuns a hootin' and a hollerin' all over this territory. Ma job gets harder as I move from one Gold Field to another. I know, that is me an' ma stubborn hornery ol' Mule here know of 24 rich an' I mean rich seams of pure Gold. All it needs to make this here ol' critter happy is that you help me peg every doggone last one of them claims.
Can YOU help Jake become rich, help him peg his claim, dodge the arrows, avoid the tomahawks, and plant the Dynamite in just the right place? . . . YOU CAN!!!

YIPPEE . . . Git yer Picks an' Shovels and join the CALIFORNIA GOLD RUSH . . . NOW

Amazing Arcade Action . . . Stunning Sound and Graphics
Available NOW for Commodore 64.

£7.95 including P & P



MICROSYSTEMS
COMMODORE 64

- * **CALIFORNIA GOLD RUSH**: PCN says "... could be another Pac-Man" What more can we say!!! (Joystick required) £7.95
- * **YAHTCEE**: This is THE version of the traditional dice game. For 1 or more players £7.95

☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆

DOZY DODO: Did you know that the Dodo lays it's eggs in mid-flight? Conservation Charlie is doing his best to save the species but is it enough? (Joystick required) £3.95
SPRITEGEN 64: Define and design your sprites the easy way £3.95
CHAIN REACTION: Control the atomic reaction in this game of skill. Great graphics — super sound £3.95
LINK-A-LINE: Make the connection 4 enjoyment £3.95
L.A. SUNSET: Could it be the final sunset for L.A. as the returning Space Shuttle goes out of control? £3.95
STAR TREK 64: Kirk, Spock and Co. beamed down to your 64. (Joystick required) £3.95
COLOUR ME QUICK: A fascinating game of logic that is highly addictive £3.95
NAUTILUS NAVIGATOR: Manoeuvre your nuclear powered Sub thro' undersea chasms, vaults and maybe tombs. But what other creatures lurk in the Deep!!! (Joystick required) £3.95

MOONBASE TOUCHDOWN: Your fuel is low, your Astro-module has an intermittent malfunction, can you reach your base . . . SAFELY!!! (Joystick required) £3.95
VEGAS SLOT: You'll hand it to this Bandit . . . It's great £3.95



STOCKING FILLER . . .
VIDEO LIBRARY CASES
Amazing Value at only £1.45 for 3 incl P & P.
5.25" Disk Library Cases hold 10 disks, blue plastic, just the thing for that extra present.
Normally £1.98 each.
Our price: 2 for £1.95 incl P & P.

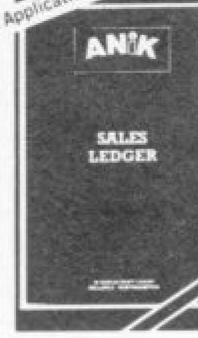
SPECTRUM

STARSHIP 2100RD: Repel the Invaders from Zenos and thwart their plans to take over the Galaxy £3.95
POLARIS PATROL: Rid our shores of the dastardly aggressors!!! (Joystick required) £3.95
USS ENTERPRISE: Boldly go on a dangerous voyage to the very limits of your Spectrum (Joystick required) £3.95
COSMIC ATTACK: Dorks, Wapraz and Neutra-Zemals in combat!!! (Joystick required) £3.95
DUMB DUCK: Blow their tiny beaks off!!! (Joystick required) £3.95
THE SEVEN HILLS: You'll jump at the chance to ski on these slopes. (Joystick required) £3.95
BATTLE STATIONS: Cosmic attackers threaten Civilisation. Is there no escape, are we doomed? (Joystick required) £3.95
PANE DAMAGE: People who live in glass houses shouldn't . . . Dynamic action. (Joystick required) £3.95
PHASOR POWER: The Ultimate weapon. Use it carefully against the planets enemies!!! (Joystick required) £3.95
HOTHOUSE HELL: Fiery, frantic, furious action with truly brilliant graphics. (Joystick required) £3.95
ALL SYSTEMS GO: Blast off into the great blue yonder and face the peril that awaits you!!! (Joystick required) £3.95
VISCIOUS VERMIN: Giant plague carrying rodents turn on the Human race and try to take over!!! (Joystick required) £3.95
ANIKMAN: Our version of the greedy gulper . . . not to be missed!!! (Joystick required) £3.95
PIGGOTT'S PONY: We bet this will be winner. You can put your shirt on it!!! (Joystick required) £3.95
MISSION POSSIBLE: Have you the qualities to cope with tommorrow's technology . . . in Space? (Joystick required) £3.95
GHASTLY GHOULS: All kinds of creepies make this game a nightmare!!! £3.95
THE FORCE . . . BEYOND!: Cosmic energy — Anik style!!! (Joystick required) £3.95
* **YAHTCEE**: Thirteen ways to roll out a winner. Multi player game — lots of fun . . . if you don't lose!!! £7.95

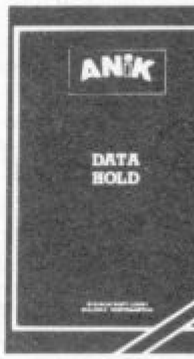
DRAGON

LEAPIN' LANCELOT: Medieval machine magic as Lancelot endeavours to rescue fair Gueneviere. (Joystick required) £3.95
GALLACTIC SURVIVAL PAK: No Astro-traveller should be without this. A collection of 3 of the best astro-games around!!! (Joystick required) £3.95
MINDBENDERS: 3 puzzles to enthrall and mystify you. Hours of mindbending fun to pass the long Winter evenings £3.95
* **YAHTCEE**: Five times as nice with our Yahtcee dice. For one or more players £7.95
GEE UP NEDDY: The odds-on favourite with all the Family. (Joystick required) £3.95
THE SEVEN HILLS: You'll jump at the chance to ski on these slopes. (Joystick required) £3.95
PHASOR POWER: The Ultimate weapon. Use it carefully against other planets enemies!!! (Joystick required) £3.95
ANIKMAN: Our version of the greedy gulper . . . not to be missed!!! (Joystick required) £3.95
BATTLE STATIONS: Cosmic attackers threaten civilisation. Is there no escape, are we doomed? (Joystick required) £3.95
ALL SYSTEMS GO: Blast off into the great blue yonder and face the peril that awaits you!!! (Joystick required) £3.95
PANE DAMAGE: People who live in glass houses shouldn't . . . Dynamic action. (Joystick required) £3.95

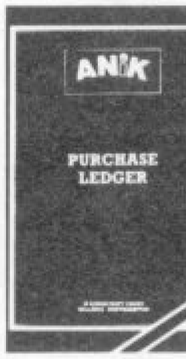
Serious Applications Programs.



SALES LEDGER
Specification as for Purchaser Ledger.
SALES LEDGER for CBM 64, SPECTRUM, DRAGON £14.95



DATAHOLD
The DBMS for the CBM 64. Up to 15 fields per record. Sort and search by any field. Calculations. Report generation.
MAIL LABELLER incl. with DATAHOLD — fully user definable.
DATAHOLD for CBM 64 . . . . . . £24.95



PURCHASE LEDGER
Fully user definable. Allows for multiple entry, invoicing and payment control. Full search and sort facilities. Print option. VAT account and analysis. Status report generation.
PURCHASE LEDGER for CBM 64, SPECTRUM, DRAGON £14.95

HOW TO ORDER

To order any games all you have to do is enter the title you wish to receive in the coupon below, write your name and address, enclose your cheque or postal order made payable to ANIK MICROSYSTEMS and post to us. DON'T FORGET—Buy any six games at £3.95 each and pay only £19.95— SAVE £4!

Your games will be despatched within 48 hours!

Post to: ANIK MICROSYSTEMS . 30 KINGSCROFT COURT . BELLINGE NORTHAMPTON . NN3 4BH
Please send me the following games for ______
I enclose my cheque/P.O. for £ ______
Name ______
Address ______
Tel. (day) ______
Tel. (eve) ______



ANIK MICROSYSTEMS
30 KINGSCROFT COURT · BELLINGE · NORTHAMPTON · NN3 4BH
TEL: (0604) 411013

The Complete Beginners' Gu

COMM
US

Par

The 6502 Instru

by Davi

Six	ACC	IMP	IMM	REL	ABS	ZP	(IND)	ABS,X	ABS,Y	ZP,X	ZP,Y	(IND,X)	(IND),Y
Transfers between internal registers													
TAX		AA [1]											
TXA		8A [1]											
TAY		A8 [1]											
TYA		98 [1]											
TSX		BA [1]											
TXS		9A [1]											

Six	ACC	IMP	IMM	REL	ABS	ZP	(IND)	ABS,X	ABS,Y	ZP,X	ZP,Y	(IND,X)	(IND),Y
Transfers betwen memory & registers													
LDA			A9 [2]		AD [3]	A5 [2]		BD [2]	B9 [3]	B5 [2]		A1 [2]	B1 [2]
STA					8D [3]	85 [2]		9D [3]	99 [3]	95 [2]		81 [2]	91 [2]
LDX			A2 [2]		AE [3]	A6 [2]			BE [3]		B6 [2]		
STX					8E [3]	86 [2]					96 [2]		
LDY			A0 [2]		AC [3]	A4 [2]		BC [3]		B4 [2]			
STY					8C [3]	84 [2]				94 [2]			

Four	ACC	IMP	IMM	REL	ABS	ZP	(IND)	ABS,X	ABS,Y	ZP,X	ZP,Y	(IND,X)	(IND),Y
Transfers between stack & registers													
PHA		48 [1]											
PLA		68 [1]											
PHP		08 [1]											
PLP		28 [1]											

Four	ACC	IMP	IMM	REL	ABS	ZP	(IND)	ABS,X	ABS,Y	ZP,X	ZP,Y	(IND,X)	(IND),Y
Comparison instructions													
BIT					2C [3]	24 [2]							
CMP			C9 [2]		CD [3]	C5 [2]		DD [3]	D9 [3]	D5 [2]		C1 [2]	D1 [2]
CPX			E0 [2]		EC [3]	E4 [2]							
CPY			C0 [2]		CC [3]	C4 [2]							

Six	ACC	IMP	IMM	REL	ABS	ZP
Increment & Decre						
INC					EE [3]	E6 [2]
DEC					CE [3]	C6 [2]
INX		E8 [1]				
DEX		CA [1]				
INY		C8 [1]				
DEY		88 [1]				

Eight	ACC	IMP	IMM	REL	ABS
Branch instructions					
BCC				90 [2]	
BCS				B0 [2]	
BEQ				F0 [2]	
BNE				D0 [2]	
BPL				10 [2]	
BMI				30 [2]	
BVC				50 [2]	
BVS				70 [2]	

Poster design: David A. Pinless

COMMODORE USER

A PARADOX PUBLICATION

DEALS FOR READERS

Our New Mail-Order Catalogue

Welcome to DEALS FOR READERS, a collection of Special Offers from Commodore User magazine.

This Catalogue offers you excellent deals on Vic and 64 products. Some of them, like the dustcovers and the Victuals tapes, we have produced ourselves. The others are things that we regard as Good Ideas and Good Value, mostly items we reviewed in Commodore User before we decided to sell them. On most of those we have fixed up discounts for readers (while we aren't allowed to sell books at a cut price, we can include P&P in our price).

If you want to take up any of the offers, just use the Order Form on the back page. And take a look through the Catalogue: even if you don't want to buy now, we'd like to know what you might be interested in seeing in future DEALS FOR READERS catalogues – let us know in the space provided on the Order Form.

A BETTER BASIC FOR THE 64

£17.95



In the December issue you'll find a review of Simons' Basic, the 'official' Commodore cartridge that provides extensions to the 64's standard Basic. We compare it with a tape called BC BASIC that does much the same kind of thing; and BC BASIC came out so well that we subsequently fixed up a discount deal for readers.

BC BASIC provides a set of extra commands for graphics, sound, I/O and miscellaneous programming. We concluded that it's much more professional than Simons' Basic, and since it's considerably cheaper it is much better value for money — especially at our price! Simon's Basic is £50; BC Basic normally sells at just £19.95, and you can order it from us at £17.95.

WEAR YOUR MAG!

Commodore User tee-shirts and sweatshirts are in good-quality cotton, ideal for late nights in front of the computer or the beach at Torremolinas or the lounge bar at the Pig and Whistle

Grey, with the magazine's logo big and bold across the chest. State size when ordering: we have small, medium, large and extra large.

Tee-shirts **£3.40**

Sweat-shirts **£7.00**

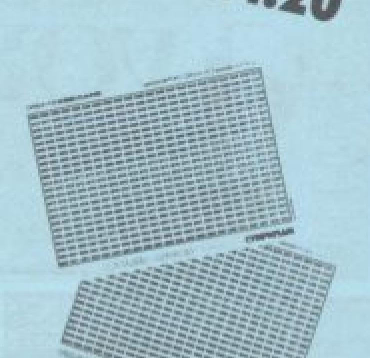


DESIGN YOUR OWN VIC SCREENS

£4.20

We came across this brilliant idea at the end of the Summer. It's simple really: the Cybergram Designs Vic-20 Graphics Aid Pack is a set of overlays and printed sheets on which you can design screen displays. With them you can immediately see the POKE locations you need for display and colour; and you can use successive sheets to set up a specific 'storyboard' from which to organise and visualise the sequences in a graphics program.

Your pack includes planner sheets for the standard 22 x 23 screen *and* plotter sheets for 1023 x 1023 hi-res graphics using the Super Expander; you also get a set of handy character designer sheets that simplify the construction of our own shapes.



Very neat, very clever — and really useful too. We're glad we can offer the Graphics Aid Pack to you . . . and at a discount on the normal RRP of £4.50.

FALLING APART

£3.99

Our Commodore user binder holds 12 issues of the magazine (and Vic Computing fits it too!) Dark blue with the magazine's name in gold on the spine: smart, sturdy and sensible — the mags are held in by strong elasticated grips, easier and neater than the kind of binder that has metal rods for the purpose. And compare our price with what other magazines charge you for binders!



ORDER FORM ON BACK PAGE

SPECIAL OFFER VOUCHERS

You should now have enough vouchers for the amazing offers from Anik, Computer Room, AR Software, Games Machine, Audiogenic, Bytewell and Stack. See their ads to get the addresses but if you missed one don't despair you can get back issues from BKT. Subscriptions, on page 62.

Couldn't be easier, really, could it?

The deals

Anik collect three vouchers for a £1.50 discount on Anik's *Yahtcee* and *California Gold Rush* games for the 64. Normal price £7.95: special offer price with three vouchers £6.45.

Computer Room collect three vouchers for a clearance offer on five Vic-20 games. Normal price £3.99 each: special offer price with three vouchers five for £5.00.

AR Software collect three vouchers for a 10 per cent on all AR games. See their advertisement or ask to see the catalogue.

Games Machine collect three vouchers for a 10 per cent on all items. Ask to see the catalogue.

Audiogenic collect three vouchers for a 'once in a lifetime' offer on Vic-20 cartridges. Normal price £19.95 each: special offer price with three vouchers £9.95. Choice, any or all of *Renaissance, Tank Atak, Outworld, Spiders of Mars, Satellites & Meteorites, Trashman, Astrol blitz, Cloudburst.*

Bytewell collect three vouchers for a 25 per cent discount on all advertised goods. See the ads, or ask for a catalogue.

Stack collect three vouchers for ten per cent off all Vic and 64 products — includes the Stack Light Rifle (RRP £29.95, voucher price £26): Light Pen (RRP £25, voucher price £22.50): 4-slot motherboard for Vic at £20.40, for 64 at £24.65: 8K Storeboard for Vic at £24.65. But remember to add 15 per cent VAT!

Novasoft two for the price of one — needs one voucher only! Send in this voucher to buy *Juggernaut* and *Mirage* for only £5.95 (normally £5.95 each).

JCL Software each voucher collected is worth 5% on the JCL IEEE adapter advert on page 20. NOrmal Price £67.85 inc Vat & p.p. with one voucher £64.00 inc Vat & p.p. with two vouchers £60.00 in Vat & p.p.

1 VOUCHER
Anik
1001184

1 VOUCHER
Games Machine
1001184

1 VOUCHER
Audiogenic
1001184

1 VOUCHER
Stack
1001184

1 VOUCHER
AR Software
1001184

1 VOUCHER
Novasoft
1001184

1 VOUCHER
Bytewell
1001184

1 VOUCHER
JCL
1001184

1 VOUCHER
Computer Room
1001184

VICWEAR



Tee-shirts **£3.40**

Sweat-shirts **£7.00**

Ah, happy memories . . . our popular collection of good-quality Vic Computing tee-shirts and sweatshirts, all with the characteristic 'Vic Computing' logo. A choice of four witty slogans or the 'Vic Computing' banner writ large.

Tee-shirts in white, blue or grey: sweatshirts in grey. State colour and size when ordering: we have small, medium, large and extra large.

VIC: ALL YOU NEED TO KNOW

VIC 20 User Guide by John Heilborn and Ran Talbott, published by McGraw-Hill.

There are dozens of books about the Vic. But this one is the best all-rounder we've come across. Not cheap, maybe: but you get a beefy large-format paperback of 387 pages, packed with information and beautifully presented with professional illustrations and clear listings.

Ideal for beginner and expert alike. Hand-holding intro to the Vic; but also includes 'how to use' sections on disk and printer as well. Excellent on graphics and animation, on writing games, on sound (eg a good chunk on combining sound and animation).

£10.95

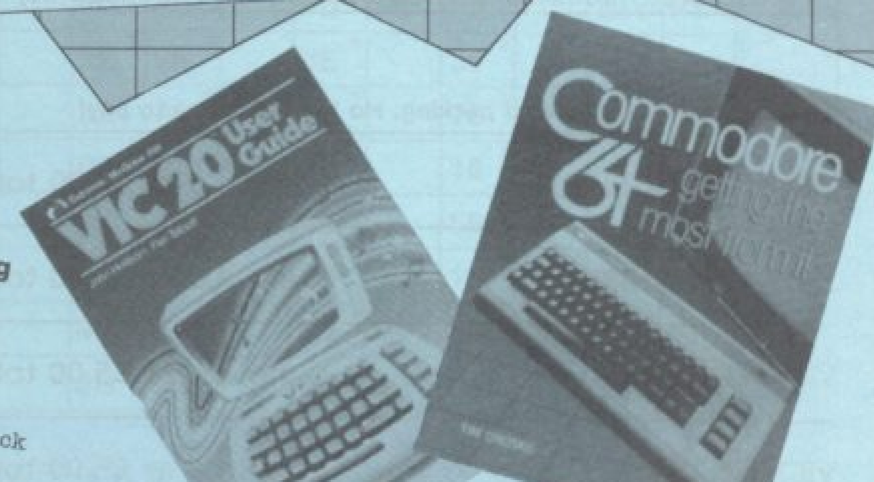
GET INSIDE THE 64

Commodore 64 — getting the most from it by Tim Onosko, published by Prentice-Hall.

Terrific value, especially at the price – 303 large-format paperback pages, a 'from the ground up' all-purpose manual/tutorial/reference for the 64 (genuinely the best we have found to date). Junk the Commodore-supplied user manual and get stuck into this: concise and sensible, clear presentation, well-written. Appendices include substantial contributions from Butterfield on the 64's memory and excellent exposés of sound and graphics.

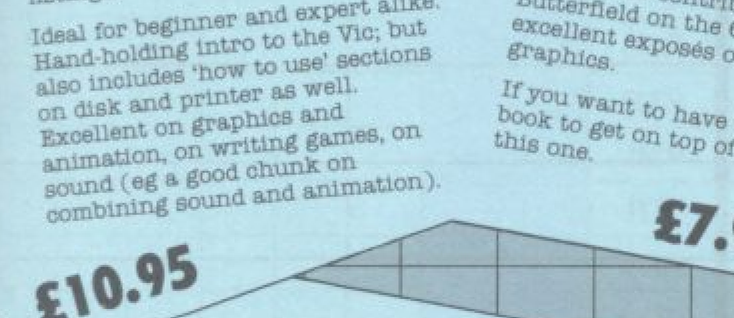
If you want to have to use only one book to get on top of your 64, buy this one.

£7.95



KEEP IT CLEAN

£2.50



Sticky keytops? Things falling past the keys into the computer? Don't take the chance. When you're not using your Vic or 64, slip over one of our tailored Commodore User dustcovers — smart black nylon, featuring the magazine's logo on top. They do keep out dust, but they'll also cope with coffee splashes (anything less than a thunderstorm in fact!), paperclips, cigarette ash, the residue of longhaired cats, and the general detritus of daily life. One size fits all.

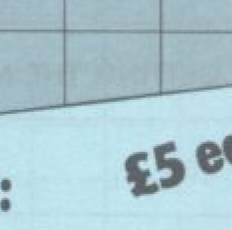
Compare our price, too. How can we do them so cheaply? And we're not compromising on quality, either: these are some of the best covers we've seen.

VICTAPES: PROGRAMS WE'VE PRINTED

£5 each

Both cassettes have ten programs on them. We use a high-quality tape, recorded both sides for security, with instructions on the liner card and references to the back issues in which the original appeared.

*** VICTAPE ONE for *any* Vic**



- ○ **BIG RACE by John Tully**
- ○ **DIY CHARACTER EDITOR by Andy Finkel**
- ○ **FLYOVER by Andrew Millett**
- ○ **ICY ROAD by Sjoren Karason**
- ○ **MORSE TRAINER by Clarence Buckley**
- ○ **MOTHER HEN by Tim Duncan**
- ○ **PEST EXTERMINATOR by John Tully**
- ○ **SEAGULL by Josh Rai**
- ○ **RESISTANCE ESCAPE by David Hearn**
- ○ **VIC RHINO by Tim Duncan**

*** VICTAPE TWO for *expanded* Vics and more advanced programmers:**

- ○ **ANALOGUE CLOCK by Trevor Starr . . . *for any Vic***
- ○ **DIY CHARACTER EDITOR by Bill Buck . . . *for 8K+ Vic***
- ○ **EXTRA HI-RES COMMANDS by C French . . . *for 8K+ Vic***
- ○ **GRAPH by Finnur Larusson . . . *for Super Expander***
- ○ **MOVIES by M Valentine . . . *for any Vic***
- ○ **POLYGONS by J P Mensinck . . . *for Super Expander***
- ○ **POSTER PRINT by Roger Peacock . . . *for 8K+ Vic and printer***
- ○ **UPSIDEDOWN by Josh Rai . . . *for any Vic***
- ○ **VIC JACK by M Hinks . . . *for 16K+ Vic***
- ○ **3D UFO by Leonard Morrow . . . *for Super Expander***

Order Form

The prices below include postage and packing within the UK and Eire only.
European and International orders please add the following amounts to the above prices:

Expect delivery in 28 days. Contact us if you haven't had your order within that time.

	European	International
Sweatshirts	£1.00	£2.00
Tee-shirts	£1.00	£2.00
All tapes	£ .50	£1.50
Books	£1.50	£3.00
Covers	£ .50	£1.00
Binders	£2.00	£4.00

Write the number you require in the relevant Boxes	T-SHIRTS White £3.40 S	M	L	XL	Blue £3.40 S	M	L	XL	Grey £3.40 S	M	L	XL	SWEAT-SHIRTS Grey £7.00 S	M	L	XL
A. VIC COMPUTING																
B. CAPTAIN KILOBYTE																
C. VICTIM																
D. POKE 36879																
E. UNEXPANDED VIC																
Please state second choice in case of unavailability																
F. COMMODORE USER									£3.40 White				£7.00 Grey			

All prices include post and packing. No hidden extras to pay!

Item		
TOTAL SWEATSHIRTS	: no. ☐ at £7.00	total ....
TOTAL TEE-SHIRTS	: no. ☐ at £3.40	total ....
VICTAPE ONE	: no. ☐ at £5.00	total ....
VICTAPE TWO	: no. ☐ at £5.00	total ....
VIC USER GUIDE	: no. ☐ at £10.95	total ....
64: GETTING THE MOST FROM IT	: no. ☐ at £7.95	total ....
COVERS	: no. ☐ at £2.50	total ....
GRAPHICS AIDS PACK	: no. ☐ at £4.20	total ....
BINDERS	: no. ☐ at £3.99	total ....
BC BASIC CASSETTES	: no. ☐ at £17.95	total ....
	GRAND TOTAL £	....

NAME	THIS IS YOUR DELIVERY LABEL — PLEASE PRINT CAREFULLY
ADDRESS	TOTAL ENCLOSED
	cheques or postal orders should be made payable
	to COMMODORE USER. Or use Access.
	Access card no:
	Date / Signature:

Catalogue Sales, Commodore User, The Metropolitan, Enfield Road, London N1 5AZ 01-241 2448

uide to Assembly Language

t 4

ction Set in Full

Pinless

Nine Arithmetic & logic instructions	ACC	IMP	IMM	REL	ABS	ZP	(IND)	ABS,X	ABS,Y	ZP,X	ZP,Y	(IND,X)	(IND),Y
ADC			69 [2]		6D [3]	65 [2]		7D [3]	79 [3]	75 [2]		61 [2]	71 [2]
SBC			E9 [2]		ED [3]	E5 [2]		FD [3]	F9 [3]	F5 [2]		E1 [2]	F1 [2]
ROL	2A [1]				2E [3]	26 [2]		3E [3]		36 [2]			
ROR	6A [1]				6E [3]	66 [2]		7E [3]		76 [2]			
ASL	0A [1]				0E [3]	06 [2]		1E [3]		16 [2]			
LSR	4A [1]				4E [3]	46 [2]		5E [3]		56 [2]			
ORA			09 [2]		0D [3]	05 [2]		1D [3]	19 [3]	15 [2]		01 [2]	11 [2]
EOR			49 [2]		4D [3]	45 [2]		5D [3]	59 [3]	55 [2]		41 [2]	51 [2]
AND			29 [2]		2D [3]	25 [2]		3D [3]	39 [3]	35 [2]		21 [2]	31 [2]

ment instructions (IND)	ABS,X	ABS,Y	ZP,X	ZP,Y	(IND,X)	(IND),Y
	FE [3]		F6 [2]			
	DE [3]		D6 [2]			

Six Control instructions	ACC	IMP	IMM	REL	ABS	ZP	(IND)	ABS,X	ABS,Y	ZP,X	ZP,Y	(IND,X)	(IND),Y
JSR					20 [3]								
RTS		60 [1]											
JMP					4C [3]		6C [3]						
RTI		40 [1]											
BRK		00 [1]											
NOP		EA [1]											

s (IND)	ABS,X	ABS,Y	ZP,X	ZP,Y	(IND,X)	(IND),Y

Seven Status flag control instructions	ACC	IMP	IMM	REL	ABS	ZP	(IND)	ABS,X	ABS,Y	ZP,X	ZP,Y	(IND,X)	(IND),Y
CLC		18 [1]											
SEC		38 [1]											
CLD		D8 [1]											
SED		F8 [1]											
CLI		58 [1]											
SEI		78 [1]											
CLV		B8 [1]											

Using cassette files

Advanced techniques

by David Bolton

Mike Todd ran through basic use of the cassette in the October 1982 *Vic Computing*. This article goes on from there — explaining how to save machine-code programs and character sets on to tape directly,and how to recover Basic programs after a LOAD ERROR.

First I'll look at relocation, or how programs load at different places. The Vic is a bit strange with all of the possible memory configurations — 3.5K, 6.5K, 11K or 28K.

One thing remains constant, however: no matter what configuration the machine is in, Basic programs can be successfully loaded even if they were saved from another. This is because Vic always tries to relocate programs (Basic or otherwise) unless you have specifically forbidden it.

Now, some programs will only run in one particular configuration. For example, Commodore's *Blitz* cassette must only be run on a 3.5K Vic because it has the character set at the end of the Basic. Machine-code programs are not generally relocatable; nor are programs which insist on screen RAM at a given address.

As I'll show later, character sets and machine-code programs can be SAVED just like Basic programs; and when loaded these must *not* be relocated.

Prevention

A Basic program will always load at the address it was saved from (ie it won't relocate) if you do a SAVE 'NAME', 1,1 and use LOAD or LOAD 'NAME',1,1.

If you load a non-relocating program into the wrong configuration, you'll find nothing at all when you LIST (although you'll get a weird ?FRE(0) value) or a screenful of garbage.

To find out where the program loaded enter the following line from the keyboard: **PRINT PEEK (193)+256 * PEEK(194).** This will usually give 4097, 1025 or 4609 respectively for 3.5K, 6.5K or 8K+ Vics.

Load errors and recovery

When saving anything on tape, Vic makes two copies of it. So when it loads it back in, it loads only the first copy and then compares this with the second (on tape).

If the two don't match, LOAD ERROR will appear and you don't have a program. When you do a LIST you'll probably see part of the program and then some strange lines and line-numbers. It could happen that the first copy was perfect and the second was corrupted, or that only one or two characters were wrong.

There is a way that we can find out if it did *nearly* load all right: and if it did then we can have a good go at recovering it. This can save many hours of work.

Here is a simple explanation of what happens when a Basic program loads:

- Locate program on tape
- Load it into memory and verify with second copy on tape
- If it verified, patch up link addresses

(A link address is a two-byte pointer to the next line. It makes GOTOs and GOSUBs much faster.)

There are two steps to attempting a recovery:

1. **Tell Vic it has a program loaded.**
2. **Patch up the link addresses.**

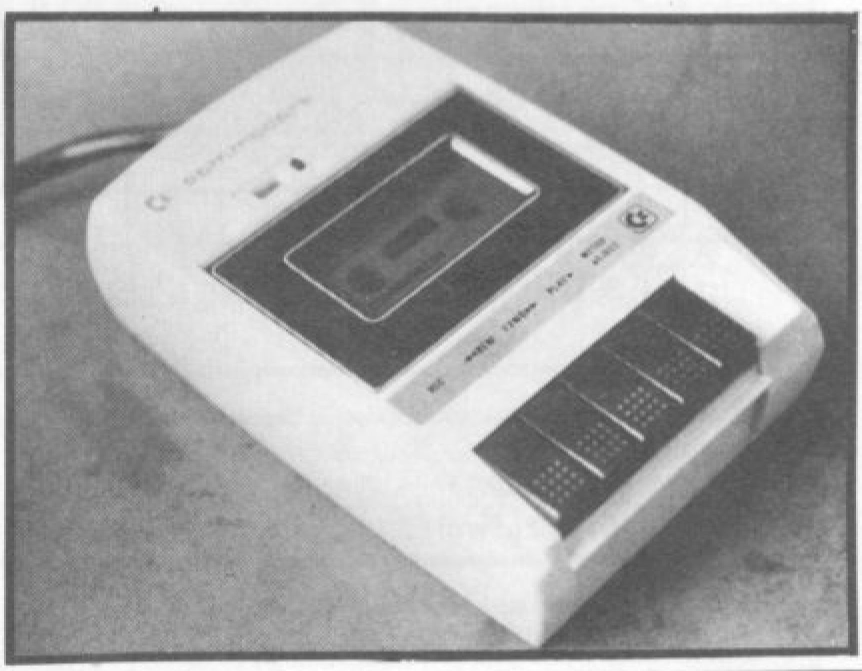
The first is fairly easy. Type in this:

POKE 45, PEEK(174)
POKE 46, PEEK(175)
CLR

PRINT FRE(0) will now show the presence of the program.

The second step is even easier. Just type in **SYS 50483.** If the loading error wasn't serious then Vic will say READY, and you have your program.

If it doesn't come back, break in with the RESTORE key and try reloading and recovering again a couple of times. If this still fails then I'm afraid you'll have to put your loss down to posterity and remember to take more copies in future.



Vic PEEK addresses

Up until now I have been doing PEEKs and POKEs without a full explanation of their exact function, so I'd better be a good host and introduce the whole gang.

These are all the locations needed in making Basic/machine code/character set saves and loads. Many of them are two bytes long and are used to contain an address. You can examine the value in bytes X and X + 1 by this:

PRINT PEEK(X)+256 * PEEK(X+1)

. . . and you can change this to a value Z by doing the next two statements:

POKE X+1,Z/256
POKE X,Z−PEEK(X+1)*256

Location	Use
43 and 44	Start of Basic program
45 and 46	End of Basic program
193 and 194	Start of LOAD or SAVE
174 and 175	End of LOAD or SAVE
183	Length of program's name
187 and 188	Address of program's name
186	Device no. (1 = tape)
185	Type of SAVE/LOAD: 0 = relocate; 1 = no relocation; 2 = end tape marker/relocate; 3 = end tape marker/no relocation

Locations 186 and 185 correspond to the 1,1 after SAVE and LOAD commands.

Having shown a list of locations, it is just a matter of setting up the correct values in them and doing a **SYS 63109.**

Loading machine code and character sets

There are two ways of loading a character set or machine-code — in a program, or directly. The Vic does loads differently in each case.

Outside a program, just enter LOAD and it will load. But it will set the 'end of Basic program' pointers (45 and 46); so watch out.

If you want to load this and use it from a Basic program, load it *before* the Basic. If the Basic program was loaded first and the machine code after, it would corrupt the 'end of Basic program' pointers — not recommended!

Within a Basic program, the program will be loaded first and RUN: and it does a LOAD from within the program. This does not change the 'end of Basic program' pointers, but it has one small effect: as soon as the LOAD finishes Vic runs the Basic program again.

I suggest the following as the first line in your program:

10 IF PEEK(665)=0 THEN POKE 665,1: LOAD

Location 665 is not normally used on the Vic. Doing it this way also lets you break into the Basic program and rerun. And if the machine-code etc. gets corrupted in any way, just do a **POKE 665, 0: RUN** to reload it.

Commodore 64 Video: A guided tour by Jim Butterfield

Part 2: Multi-colour and interrupts

The story so far: we're touring the 6566 chip, which gives the Commodore 64 its video. We have noted that the chip goes to memory for its video information, but can only reach 16K at a time; the computer controls which bank of 16K, via control lines in 56576 (hex DD00). Then we picked out the functions of the video control word at 53265 (hex D011).

This time we'll look at some more key locations and talk about interrupts.

We've seen the variety of important controls that we can reach in location 53625 – vertical screen positioning, screen blank, bit mapping, extended colour. There's a second control location, at 53270 (hexadecimal D016): let's look at it.

The first thing we should note about this location is that the two high bits are not used. That means that we can usefully poke only values from 0 to 63 into there.

It happens that if we PEEK 53270, we'll probably see a number that is 192 too big; if you want to see the working value, use **PEEK (53270) AND 63** which will throw away the unused part of the number.

We saw a vertical fine scroll in location 53265. Location 53270 has a horizontal fine scroll that works exactly the same way. Type:

FOR J=8 TO 15:POKE 53270, J:NEXT J

You'll see the screen characters slide over horizontally. As with the vertical fine scroll, we also have facilities for trimming the size of the screen.

Restore the screen to its original form with POKE 53270,8. Now, shrink the screen by typing POKE 53270,0 ... you'll see a character disappear from each end. In other words, you now have a 38-character screen instead of 40 characters. Don't forget that fine scroll and shrink can be effectively used together.

If you add 16 to the contents of 53270, you'll switch to multi-colour mode. This is not the same as extended colour which we discussed previously; multi-colour allows *selected* characters to be shown on the screen in a combination of colours. Extended colour, you may remember, allows screen background and foreground to be individually set on each character.

If you're familiar with the Vic-20, you'll find that setting the multi-colour mode makes the Commodore 64 behave in the same way. Here's the trick: we invoke multi-colour on an individual character by giving that character a colour value greater than 7. This way the regular colours (red, blue, black) behave normally; but the new pastels (grey, puce) switch to multi-colour mode.

You'll need to create a new character base to exploit the advantages of multi-colour, since the old characters weren't drawn with colour in mind. We can however get a quick idea of the feature by invoking it. POKE 53270,24 sets up multi-colour; the screen characters may turn a little muddy, but don't worry about them. Now set a primary colour such as cyan and type a line. Normal, right?

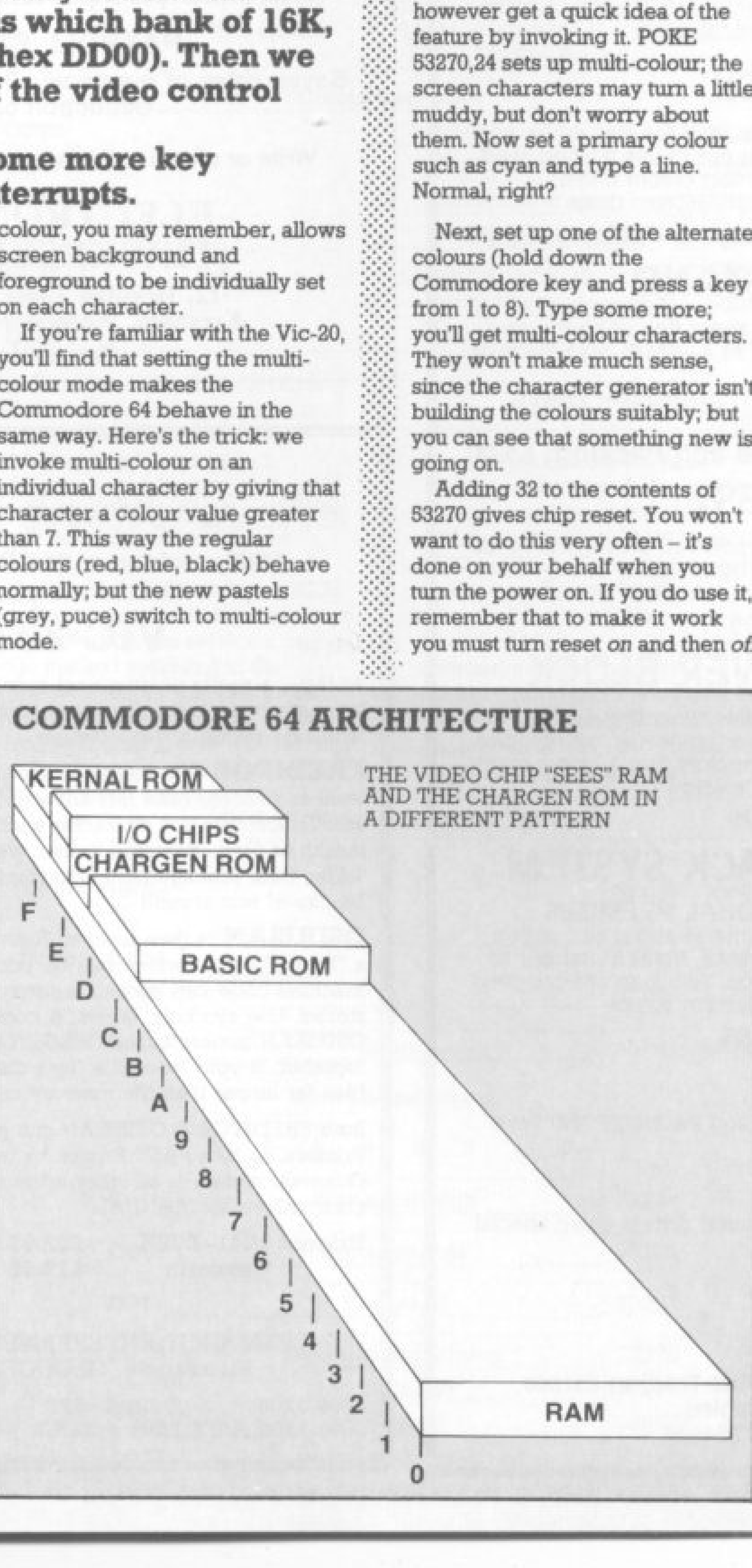
Next, set up one of the alternate colours (hold down the Commodore key and press a key from 1 to 8). Type some more; you'll get multi-colour characters. They won't make much sense, since the character generator isn't building the colours suitably; but you can see that something new is going on.

Adding 32 to the contents of 53270 gives chip reset. You won't want to do this very often – it's done on your behalf when you turn the power on. If you do use it, remember that to make it work you must turn reset *on* and then *off*



again. POKE 53270,32 : POKE 53270,8 will clear you out of multi-colour mode.

COMMODORE 64 ARCHITECTURE



Siting screen and characters

Location 53272 sets the location of screen RAM (the video matrix) and the character generator (the character base). Don't forget that they must be in the same 16K block as determined by the low bits of address 56576.

You can get the basic address of screen RAM as follows: take the contents of 53272 and divide by 16. Throw away the remainder and multiply by 1024; and you have the screen address.

You can get the basic address of the character base by dividing the contents of 53272 by 16. Take the remainder, subtract one if it's odd, and multiply by 1042; that's the character base address.

Both addresses will need to be adjusted to allow for the 16K quadrant we have selected.

Now, if we are in bit map mode, we get the character base address in a slightly different way. Divide the contents of 53272 by 16; take the remainder and divide by 8, discarding the remainder; finally, multiply by 8192. That's the bit image; it should be either 0 or 8192.

How does this work out in the standard Commodore 64? We may PEEK 53272 and see a value of 21. That means the screen is at INT(21/16)*1024, or address 1024. Right on! The character matrix works out: the remainder of 21/16 is 5; drop one for the odd number, giving four; multiply by 1024 to get address 4096.

You may remember that our discussion last time indicated that

NEWSCOPE DEVELOPMENTS LTD



A—STACK

TV/MONITOR STAND which includes a shelf for disc drives etc and has space to stow a micro when not in use. Strong steel construction with attractive matt cream finish.
Size 430mm wide, 200mm high, 360mm deep.

Price: £23.23 **Postage & Packing: £4.00**

PRINTERS STAND

Allows printer to stand over a 2000 sheet box of continuous listing paper. Same colour and finish as A—Stack, also made of steel.
Dimensions are height — 210mm high, depth — 250mm, width — 430mm.

Price: £16.95 **Postage and Packing: £3.00**

BOOK REST

Lightweight rest for books, listings etc fitted on vertical hinge which can be attached to the left or right side of the A—Stack. Same colour and finish as above.

Price: £7.99

MULTI-WAY POWER BLOCK

Up to four separate power supplies for computer and peripherals from a single mains power point. Can be fitted to A—Stack and supplied with four connectors and 2 metre mains cable. Only 150mm × 45mm.

Price: £9.99

LOCKABLE A—STACK SYSTEM

SUITABLE FOR EDUCATIONAL PREMISES

Lockable A—Stack System is the same as above but with a locking front plate, bar across the back, holes in flanges to allow unit to be attached to a worktop. Two keys are provided.
Size: same as A—Stack System above.

Price: £39.95

If all five items ordered: Postage and Packing FREE! Save £7.00

Dealer enquiries welcome, educational orders given special discount.

Orders to:
15b, Chemical Road, West Wilts Trading Estate,
Westbury, Wiltshire.
Tel: 0373-822940/864644

LOW PRICE HIGH QUALITY BUSINESS SOFTWARE FOR COMMODORE 32K PET AND 64

PURCHASE AND SALES CONTROL £80 + VAT

Runs both purchase and sales ledgers with optional calculation of VAT from the gross or net amount, analysis by accounting period,'due for payment' report, totals for net VAT and gross. Prints invoices on your own stationery laid out according to your own instructions.

STOCK CONTROL £40 + VAT

Keeps detailed stock records including stock location, re-order level, quantity on order, cost and selling prices and stock valuation.

NOMINAL LEDGER £60 + VAT

Produces trial balance and up to 20 reports in addition to profit and loss and balance sheet. This programme is intended for use on its own, but it can read files set-up by our purchase and sales control.

PAYROLL £160 + VAT

Seven rates of overtime, all tax codes, pay slips, full deduction cards, etc.

Write or phone for details and complete software list.

ELECTRONIC AIDS (TEWKESBURY) LTD

12, Drysdale Close, Wickhamford,
Evesham, Worcestershire, WR11 6RZ
Tel: 0386 831020

BREAK AWAY FROM BASIC

6502 machine code EDITOR-ASSEMBLER
for the serious user of the

VIC-20 & C-64

At last – a really professional software package written in machine code, for writing and running your own ASSEMBLER language programs/subroutines.

FREDITOR lets you write the program or any other text you want to process (like this advert). The screen automatically scrolls across a 255 character width, and up and down any length of file ... Beautiful to use, with FIND/REPLACE feature, TABs, Disk Management Commands, upper & lower case. MOVE blocks of text around ...

OSIRISAN is then used to Assemble your "source" producing a "listing" output which can be printed out or stored, whilst the machine code can go into memory ready for running or can be stored. Use symbols, labels, & comments in the source text. OSIRISAN generates a SYMBOL TABLE. You can CHAIN files together. If you `ssemble from disk onto disk you can handle files far larger than the memory capacity of the computer.

Both FREDITOR & OSIRISAN can print out onto 1515 or 1525 Printers, or to a FAST Printer by using the PARALLEL PORT. Connection data & all other information appears in a comprehensive MANUAL.

Prices: 1541–DISK **£22.95 State**
Cassette **£19.95 machine**

ELMHIRST ENTERPRISES 99 Porchester Road,
Hucclecote, GLOUCESTER. (0452) 64938

```
0000 1200      OSIRIS=$FF
0001 1200 A9FF LDA #OSIRIS    ;Get yours now!
```

Light Pen

Locations 53267 and 53268 (hex D013 and D014) are the light pen registers. A light pen can be plugged into joystick port number one; if it sees a suitable signal from the screen, the X and Y values will be latched into these registers. The light pen can be used on an interrupt basis: we can 'stop the music' and get immediate action if we chose to set things up that way.

This is the second time we've mentioned interrupts. Perhaps we'd better discuss them a little more closely.

Interrupts

Interrupts are for machine language maniacs ... things happen too fast for Basic to cope in this area. There are four types of interrupt: raster, light pen, and two kinds of sprite collision. (Daddy, what's a sprite? Shut up, kid, we'll talk about them in part 3.) We may use all of them or none – and even when these signals are not used for interrupt, we can check them.

Location 53273 (Hex D019) tells us which of the four events have occurred. We don't need to make the interrupts 'live'; they will signal us any time the particular event happens. The weights are as follows:

- 1 (bit 0) – the raster has matched the preset line value
- 2 (bit 1) – a sprite has collided with the screen background
- 4 (bit 2) – a sprite has collided with another sprite
- 8 (bit 3) – the light pen has sensed a signal
- 128 (bit 7) – one of the above has triggered a live interrupt

Once any of the above take place, the bit will remain stuck on until you turn it off. How do you turn it off? This may sound goofy, but you turn an interrupt signal off by trying to turn it on. Hmmm ... let me try that again.

Suppose that we have both a raster and a light pen signal; we'll see a value of 9 (8 + 1) in the interrupt register. Now – suppose further that we are ready to handle the light pen, so we want to turn its signal off. We do this by storing 8 into location 53273.

Huh? Wouldn't that turn it on? Nope: it turns it off, and leaves the other bit alone. So after storing 8, we look at the register again and (you guessed it) we see a value of 1 there. Honest.

6566 Video – Control and Misc. Registers

Hex	Bits	Decimal
D011	(unlabelled) / Extend Colour / Bit Map / Display Enable / Row Select / Y-scroll	53265
D012	Raster register	53266
D013	Light Pen input X	53267
D014	Light Pen input Y	53268
D016	X / Reset / Multi-Colour / Column Select / X-scroll	53270
D018	Screen (Video Matrix) vm13, vm12, vm11, vm10 / Character Base cb13, cb12, cb11 / X	53272
D019	IRQ / IRQ sense / LP / SSC / SBC / RST	53273
	IRQ enable / Light Pen / Collision Sprite, Back / Rastr	53274

Colour Registers

Hex	Register	Decimal
D020	Exterior	53280
D021	Background no. 0	53281
D022	Background no. 1	53282
D023	Background no. 2	53283
D024	Background no. 3	53284
D025	Sprite Multicolour no. 0	53285
D026	Sprite Multicolour no. 1	53286

Location 53274 (Hex D01A) is the interrupt enable register: it sets the above signals for 'live interrupt'. Select bits 0 to 3 corresponding to the interrupts you want. Whatever you select will now trigger a processor interrupt when it happens, and also light up that high bit of 53273.

Don't forget to shut the interrupt flag off when you service it, using the method indicated in the previous paragraph. Otherwise, when you finish the job and return from the interrupt (with RTI) it will re-interrupt you all over again.

A Little Colour

Some of the colours we have mentioned and some we have yet to discuss are neatly stored in addresses 53280 to 53286 (Hex D020 to D026). We may store only values 0 to 15 here, for the sixteen Commodore 64 colours.
The chart shows it all: the exterior (border) colour, then four background colours (they may be selected as part of multicolour characters or bits); and finally, two colours reserved especially for sprites. (Daddy, what's a sprite? Isn't it time you were in bed, kid?) RAM was replaced by the character generator ROM at this video chip address. And when we flipped to bit mapping in the last episode, we got a high-resolution screen from address 0 (remainder still 5, divide by 8 giving 0, multiply by 8192 and still get 0).

If you'd like to try your hand at the arithmetic, flip to upper/lower case mode (hold down shift and press the Commodore key) and see what addresses have changed. Or if you'd rather, try typing in ...

FOR J=1 TO 100:POKE 53272,21: POKE 53272,23:NEXT J

and watch the action.

6566 Video – Sprite Registers

Sprite 0	Sprite 7	Register	Sprite 0	Sprite 7
D000	D00E	Position X	53248	53262
D001	D00F	Position Y	53249	53263
D027	D02E	Colour	53287	53294

Sprite bit positions

7 6 5 4 3 2 1 0

Hex	Register	Decimal
D010	X-position high	53264
D015	Sprite enable	53269
D017	Y-expand	53271
D01B	Background priority	53275
D01C	Multicolour	53276
D01D	X-expand	53277
D01E	Interrupt: sprite collision	53276
D01F	Interrupt: sprite/background collision	53279

The Raster Register

Location 53266 (hex D012) and the high bit of the previous location are not much use to the Basic programmer, but can be very valuable to the machine language tyro. Here's the idea: by looking at these locations, you can tell exactly where the screen is being scanned at that moment.

This allows you to change the screen as it's being scanned. Halfway down you could switch from characters to bit map, or change to multicolour, or move a sprite that has already been displayed.

If you're really hot on machine language you may want to take an extra step. Instead of watching where the screen is, you can leave a message: "wake me when you get to scan line 100". Machine-code tyros will recognize this as an interrupt request. How do you set the identity of the desired scan line? By placing it into the same locations, that's how. We have a dual function here. When we read, we recall the scan location; when we write, we store an interrupt value.

Summary

Sorry, but we had to be a little more technical this time around. Many of the locations are of value to machine language users; we can't show their features with simple PEEKs and POKEs.

But they are powerful, and they are not hard to use once you get a feeling for them. The possibilities are almost limitless.

Next time, we'll take a look at sprites, and fit them into the picture (literally). They are great fun ...

Orchard

by Dave Hearn

A neat variation on a theme: you're picking apples in an orchard, starting from the top left corner while the apples drop at random from the trees scattered around the screen. Nice and gentle . . . You get points according to how many apples you manage and what colour they are. Easy, right?

Well, no. You're competing with the Purple Apple Monster. He/she/it wants the apples as well; and if you get in the way of P.A.M., he/she/it will eat you too. P.A.M. won't come hunting for you, but he/she/it sure don't like any competition.

Then there are the spiders. They just get in the way and block your path – and Lord knows the P.A.M. seems to be both closer to the windfalls and faster at getting to them in the first place. But the more apples the P.A.M. eats, the more spiders appear. So it gets progressively more difficult.

All in all, a nice game.

It loads in two parts, so save the first one before you start typing the second – with most two-part games it makes sense to put a LOAD command at the end of the first section so that the second is loaded automatically as soon as part one has finished setting up the user-defined graphics.

When you RUN part two you'll see that you have three lives. There's a 'high score' couner too. Here's the scoring:

- **red apple . . . 2**
- **green apple . . . 4**
- **gold apple . . . 6**

Any time you get a gold apple, you're magically empowered (for a limited time) to bump off spiders by stomping on them. They score too:

- **spider . . . 10**

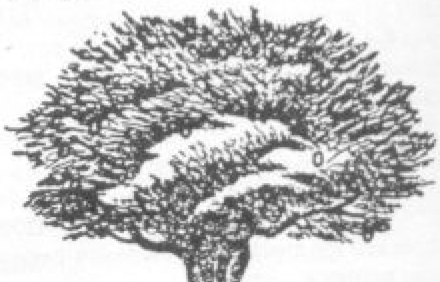
The graphics are pretty good – especially the apple trees! – and the sound effects are both effective and applied in moderation.

—Lightspeed————



```
10 PRINT "[CLR]"
20 POKE 36879,31
30 PRINT "[WHT]"
40 PRINT "[RED][CUD][CUD][CUD][CUD][RVS]ORCHARD"
50 PRINT "[GRN][CUD][CUD]DESIGN&PROGRAM[CUR][CUD][CUD][CUR]BYDAVEHEARN"
60 PRINT "[CYN][CUD][CUD][CUD]PLEASEWAIT"
1010 POKE 51,255: POKE 52,27: POKE 55,255: POKE 56,27
1020 FORI=0TO511
1030 POKE 7168+I,PEEK(32768+I): NEXT
1040 FORI=0TO(9*8-1): READA
1050 POKE 7168+I+(33*8),A: NEXT
1066 DATA28,44,28,255,1,62,54,119
1067 DATA56,22,56,255,128,124,24,60
1068 DATA129,90,60,74,126,255,219,195
1069 DATA0,0,90,60,126,74,255,102
1070 DATA129,90,60,74,102,195,129,126
1071 DATA0,54,8,28,62,62,28,0
1072 DATA60,126,90,126,255,165,165,165
1073 DATA0,124,222,254,246,254,92,124
1074 DATA56,56,56,56,56,56,0,0
1080 DATA999
1100 POKE 36869,255
1125 PRINT "[CLR][RED]JOYSTICKONLY"
1130 PRINT "[BLK][CUD]PICKAPPLESBEFORE[CUD]MONSTER..."
1140 PRINT "[RED][CUD]&[BLK]......2POINTS
1150 PRINT "[GRN][CUD]&[BLK]......4POINTS
1160 PRINT "[YEL][CUD]&[BLK]......6POINTS
1170 PRINT "[CUD][BLK]'......10POINTS
1180 PRINT "[CUD]YOUCANONLYKILL'IF[CUD]YOUFIRSTPICK[YEL]&[BLK]..."
1185 FORT=1TO4999: NEXT
1190 PRINT "[CUD][BLK]NOWLOAD/RUNPART2"
1200 PRINT "[CUD][RED]GOODLUCK"
```





```
100 B=0: C=30720: V1=36875: V2=36877: SC=0: MA=3: MS=0: MO=35: MV=8185: L=1: R=2
1: OB=39: CH=33
110 CV=7726: YU=128: CS=0: AC=2: PA=7878: AP=10
120 POKE 36878,15: POKE 36869,255
130 POKE 36879,31: PRINT "[CLR]"
140 POKE 7702+B,40: POKE 7723+B,40: POKE 7724+B,41: POKE 7745+B,41
150 POKE 7702+B+C,5: POKE 7723+B+C,5: POKE 7724+B+C,7: POKE 7745+B+C,7
160 FORA=1TO18
170 D=INT(RND(1)*20)+0
180 POKE 7703+B+D,40: POKE 7725+B+D,41: POKE V1,123+(D*5)
190 POKE 7703+B+D+C,5: POKE 7725+B+D+C,7
200 NEXTA
210 B=B+66
220 IFB=462THENPOKE V1,0: GOTO240
230 GOTO140
240 GOSUB750: GOSUB760: POKE 8185,35: POKE 38905,4: GOSUB970
250 POKE 8164,40: POKE 8164+C,5
260 SM=8164: SA=21
270 IFMS<3THENH=AP: G=PA: GOTO300
280 H=A: G=S
290 IFHO=1THEN330
300 IFG<SMANDPEEK(SM+SA-22)<40THENSM=SM-22: HO=0: HL=0: GOTO400
310 IFG>SMANDPEEK(SM+SA+22)<40THENSM=SM+22: HO=0: HL=0: GOTO400
320 IFHO=2THEN370
330 IFH>SAANDPEEK(SM+SA+1)<40THENSA=SA+1: GOTO400: HO=0
340 IFH<SAANDPEEK(SM+SA-1)<40THENSA=SA-1: GOTO400: HO=0
350 IFH=SAANDHO=1 THENHO=0: GOTO400
360 IFPEEK(SM+SA-22)<40ANDPEEK(SM+SA+22)<40THENHO=1: SM=SM+22: GOTO400SP=2: GOSU
B1060
370 IFSA<2THENHO=2: HL=1
380 IFHL=1THENSA=SA+1: HO=2: GOTO400
390 SA=SA-1: HO=2 : GOTO400
400 IFPEEK(SA+SM)=39THENSP=2: GOSUB1060
410 POKE MV,32: POKE SM+SA+C,4: POKE SM+SA,MO: MV=SM+SA
420 IFSM+SA=AP+PATHENMS=MS+1: CS=0: GOSUB750: GOSUB1120: GOSUB910: GOSUB1060
430 IFS+A=SA+SMTHENMA=MA-1: MS=0: GOSUB750: GOSUB1120: GOSUB760
440 IFMO=35THENMO=36: POKE V1,228+SA: GOTO460
450 MO=35: POKE V1,225+SA
460 POKE V1,0
470 POKE 37151,0: BA=37151: PB=37152: RB=37154
480 AA=PEEK(BA): POKE RB,127: B=PEEK(PB): POKE RB,255
490 IF(AAAND4)=0THEN540
500 IF(AAAND8)=0THEN560
510 IF(BAND128)=0THEN580
520 IF(AAAND16)=0THEN600
```



```
530 GOTO660
540 IFPEEK(S+A-22)<OBANDS>7702THENS=S-22: GOTO620
550 GOTO620
560 IFPEEK(S+A+22)<OBANDS<8164THENS=S+22: GOTO620
570 GOTO620
580 IFPEEK(S+A+1)<OBTHENA=A+1: GOTO620
590 GOTO620
600 IFPEEK(S+A-1)<OBTHENA=A-1: GOTO620
610 GOTO620
620 IFOB=40ANDPEEK(S+A)=39THENSC=SC+10: GOSUB750: POKE V1,240
630 POKE CV,32: POKE S+A+C,6: POKE S+A,CH: CV=S+A
640 IFCH=33THENCH=34: GOTO660
650 CH=33
660 IFS+A=SM+SATHEN430
670 IFS+A=AP+PATHENPOKE V1,0: CS=CS+1: MS=0: SC=SC+(2*CS):
GOSUB750: GOSUB910
680 IFCS<3THEN270
690 IFCS=3THENCS=3
700 OB=40
710 POKE V1,YU
720 YU=YU+1
730 IFYU=255THENYU=128: CS=0: OB=39: GOTO680
740 GOTO470
750 PRINT "[RED][HOM][CUR][CUR][CUR]SCORE[BLK]"SC: RETURN
760 IFMA=3THENPOKE 7680,33: POKE 7682,34: POKE 7726,33:
POKE 38400,6: POKE 38402,6: POKE 38446,6
770 POKE 7704,32
780 IFMA<3THENPOKE 7680,32
790 IFMA<2THENPOKE 7682,32
800 IFMA=0THENGOTO820
810 S=7724: A=2: POKE S+A,CH: CV=S+A : RETURN
820 PRINT "[HOM]GAMEOVER"
830 FORT=1TO1000: NEXT
840 IFSC>HCTHENHC=SC
850 PRINT "[HOM]"
860 PRINT "[HOM][BLK]SCORE"SC"[RED]HIGH"HC
870 PRINT "[CUD][RED]&&&&&[BLK]AGAIN?[RED]&&&&&&"
880 GETA$: IFA$=""THEN880
890 IFA$<>"Y"THEN880
900 GOTO100
910 R1=22: R2=0
920 GOSUB1050
930 AP=X: GOSUB1050: PA=7702+(22*X)
940 IFCS=2THENPA=S
950 IFPEEK(PA+AP)=32ANDPEEK(PA+AP-22)=41THEN970
960 GOTO910
970 FORE=250TO128STEP-1
980 POKE V1,E
990 NEXTE
1000 IFCS<1THENAC=2
1010 IFCS=1THENAC=5
1020 IFCS>1THENAC=7
1030 POKE PA+AP+C,AC: POKE PA+AP,38: POKE V1,0
1040 RETURN
1050 X=INT(RND(1)*R1)+R2: RETURN
1060 R1=417: R2=7768
1070 GOSUB1050
1080 IFPEEK(X)=32THENPOKE X,39: POKE X+C,0: SP=SP+1: GOTO1100
1090 GOTO1060
1100 IFMS>1ANDSP<2THEN1060
1110 SP=0: RETURN
1120 POKE V1,0: FORE=1TO10
1130 FORN=128TO148
1140 POKE SM+SA,MO: POKE V2,N: POKE SM+SA+C,4
1150 FORT=1TO20: NEXTT
1160 POKE SM+SA,37: POKE V2,0
1170 FORT=1TO60: NEXTT
1180 NEXTE
1190 FORT=1TO150: NEXT
1200 FORE=1TO20
1210 POKE V1,128: FORT=1TO5: NEXTT
1220 POKE V1,0: FORT=1TO5: NEXTT
1230 NEXTE
1240 POKE V1,0: RETURN
```

Victuals

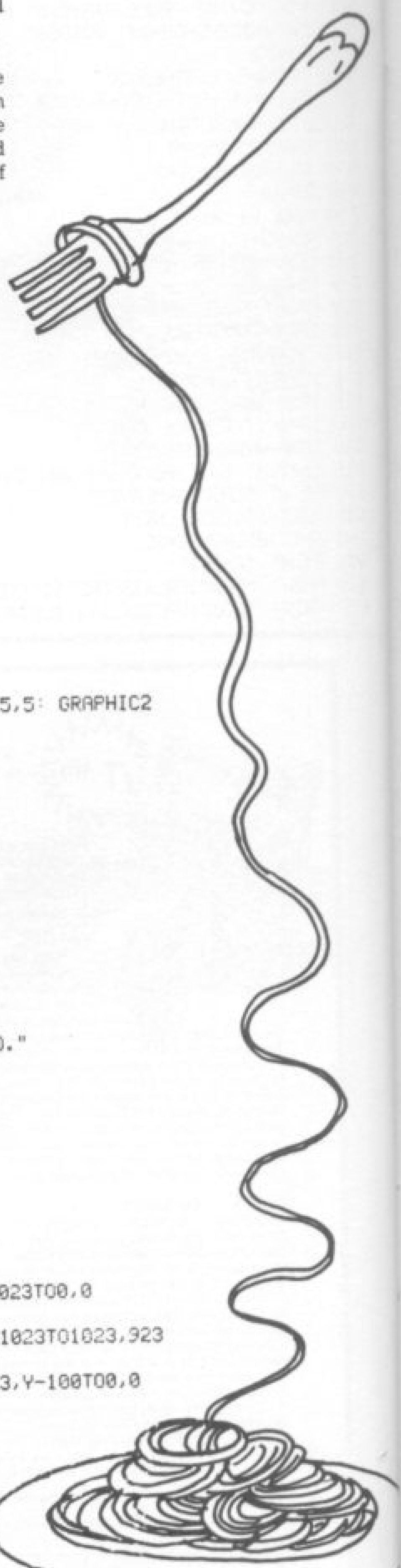
Hi-res Demo

by David Speck

Vic and Super Expander

David is only 13 but he's produced four basic hi-res drawings which the more experienced among you will be able to adapt.

He's thought up some imaginative titles for his work: Passage, Death Star, Smashed Grid and Pothole (we thought Death Star looked more like a tunnel, or a plate of coiled spaghetti).



```
10 REM

 3D HI-RES DEMO

20 REM

 BY DAVID SPECK

30 REM

 AGE 13

40 REM

 SUPER EXPANDER REQUIRED

50 REM

 SET UP GRAPHICS

60 PRINT CHR$(8): COLOR0,0,5,5: GRAPHIC2
70 REM

 TITLES

80 SCNCLR
90 GOSUB800: REM

 DRAW BORDER

100 CHAR3,9,"3D"
110 CHAR5,5,"HI-RESDEMO"
120 CHAR7,3,"BYDAVIDSPECK"
130 CHAR9,7,"AGE13"
140 CHAR11,4,"PRESSAKEY"
150 CHAR13,2,"AFTEREACHDEMO."
160 GOSUB830: REM

 WAIT FOR KEY

170 REM

 PASSAGE

180 SCNCLR
190 FORX=0TO1023STEP100
200 DRAW5,0,0TOX,1023TO0,1023TO0,0
210 NEXT
220 DRAW5,1000,1023TO1023,1023TO1023,923
230 FORY=923TO50STEP-100
240 DRAW5,0,0TO1023,YTO1023,Y-100TO0,0
250 NEXT
260 FORX=15TO975STEP100
270 DRAW5,0,XTOX-15,X
280 DRAW5,X,23TOX-15,X
290 NEXT
300 GOSUB830
310 REM
```

```
DEATH STAR

320 SCNCLR
330 GOSUB800
340 X=512
350 FORR=500TO200STEP-30
360 CIRCLE5,X,512,R*0.7,R
370 X=X+15
380 NEXT
390 FORR=200TO0STEP-15
400 CIRCLE5,X,512,R*0.7,R
410 X=X-7
420 NEXT
430 GOSUB830
440 REM

SMASHED GRID

450 SCNCLR
460 FORX=0TO1023STEP30
470 DRAW5,1023-X,0TO1023,1023-X
480 DRAW5,0,1023-XTO1023-X,1023
490 NEXT
500 GOSUB830
510 REM

POT HOLE

520 SCNCLR
530 GOSUB800
540 FORX=0TO1023STEP60
550 DRAW5,512,512TOX,0
560 DRAW5,512,512TO1023,X
570 DRAW5,512,512TOX,1023
580 DRAW5,512,512TO0,X
590 NEXT
600 GOSUB830
610 REM

REPEAT?

620 SCNCLR
630 GOSUB800
640 CHAR9,5,"AGAIN?(Y/N)"
650 POKE 198,0
660 GETA$: IFA$=""THEN660
670 IFA$="Y"THENRUN
680 IFA$="N"THEN700
690 GOTO660
700 REM

GOODBYE

710 SCNCLR
720 GOSUB800
730 CHAR9,6,"GOODBYE!"
740 GOSUB830
750 REM

EXIT FROM GRAPHICS

760 COLOR1,3,6,6
770 GRAPHIC0
780 POKE 198,0
790 END
800 REM

BORDER SUBROUTINE

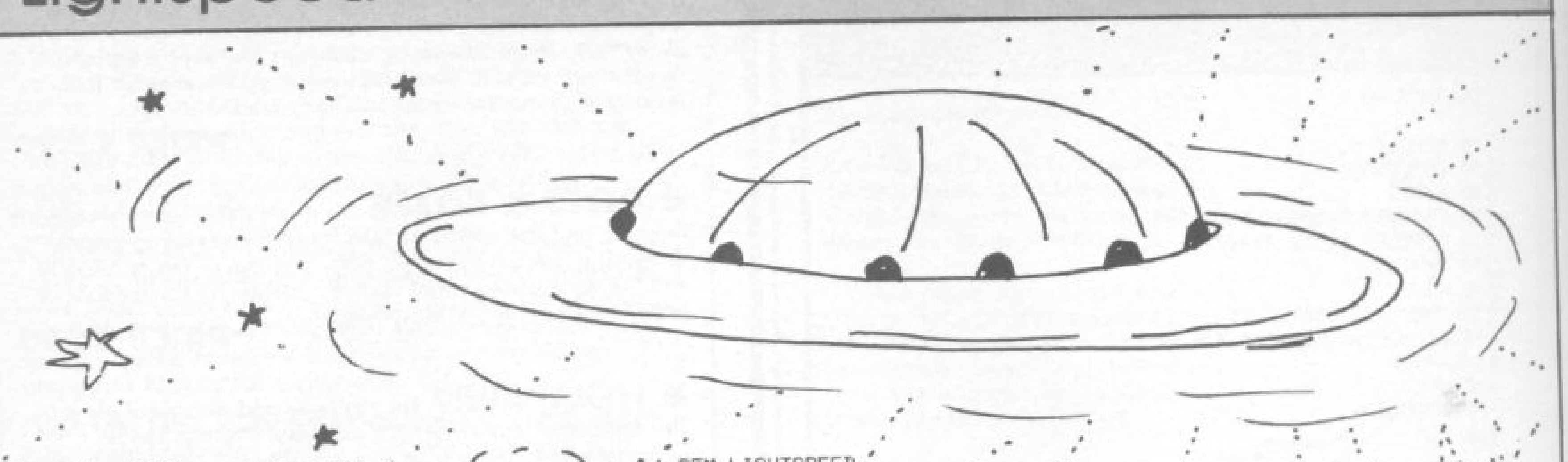
810 DRAW5,0,0TO1023,0TO1023,1023TO0,1023TO0,0
820 RETURN
830 REM

WAIT FOR KEY SUBROUTINE

840 POKE 198,0
850 WAIT198,1
860 RETURN
```

Lightspeed

by Albert van Aardt



Here is a little game inspired by the movie TRON – which all of you went to see, right? Remember the scene where the 'light cycles' raced on the plain, leaving a wall behind them? Well, the idea here is the same.

The object of the game is to make your opponent crash; so skill and planning is important, not only reflexes. The game is written for two players, but it should not be too difficult to change it in order to let the 64 play against you. The speed is variable, and two characters (an asterisk and a dot) are used to distinguish between player 1 and player 2. this is done by the POKEs in lines 710 and 720; codes 42 and 81 are used. Of course, you can POKE any other ASCII code at that point for different characters.

The keys used to control the movement of the characters are **W** (up); **S** (right); **A** (left); and **Z** (down) for the player on the left. Player 2, the one on the right, uses @;: and / respectively. A look at the keyboard will show the logic behind this.

Don't try to turn around with this game; you'll crash in your own trail! In other words, if you're moving 'up' you can't press the key for 'down' – because behind you is your 'light wall' and your opponent will score.

To convert the game to run with two joysticks, lines 100 to 199 will have to be changed. Type it in, and try your luck!

```
1 REM LIGHTSPEED
2 CLR
5 POKE 53272,21
10 PRINT"███                    █LIGHT SPEED!█"
15 PRINT"██         LEFT PLAYER          RIGHT PLAYER"
20 PRINT"███UP    =      W                      @"
30 PRINT"███RIGHT=       S                      ;"
40 PRINT"███LEFT  =      A                      :"
50 PRINT"███DOWN  =      Z                      /"
52 INPUT"█████SPEED (1 = FAST UP TO 10 =SLOW)";SP:SP=INT(SP*15)
65 GOSUB 500
70 POKE53281,1:LZ=1504:C=67:X=1:Y=0
75 LA=1543:K=67:A=-1:B=0
100 REM DIRECTION
110 GETK$
115 IFK$=""THENGOTO160
120 IFK$="@"THENA=0:B=-1:GOTO160
125 IFK$="W"THENX=0:Y=-1:GOTO160
130 IFK$="/"THENA=0:B=1:GOTO160
135 IFK$="Z"THENX=0:Y=1:GOTO160
140 IFK$=";"THENA=1:B=0:GOTO160
145 IFK$="S"THENX=1:Y=0:GOTO160
150 IFK$=":"THENB=0:A=-1:GOTO160
155 IFK$="A"THENY=0:X=-1:GOTO160
160 GOSUB 700:REM TO PLOT NEXT POS
199 GOTO 100
200 REM ERROR CHECK
210 IF L< 1024 OR L>2023 THEN 230
215 IF  PEEK(L)<>32THEN230
220 GOTO299
230 FOR J=1TO3:POKE(53281),J:GOSUB600
235 NEXTJ
238 POKE(53281),1
239 A=0:B=A:X=A:Y=A
240 GOSUB 500
290 PRINT"████████████████████PRESS SPACE TO CONTINUE"
295 GETA$:IFA$<>" "THEN295
296 PRINT"██████████████████████
299 RETURN
500 REM SET SCORE
510 IFP=1THENP1=P1+1:P=0
520 IFP=2THENP2=P2+1:P=0
530 PRINT"██          PLAYER 1 =";P1;" PLAYER 2 =";P2
535 PRINT"________________________________________";
537 FORI=1TO21:PRINT"|                                      |";:NEXTI
538 PRINT"________________________________________";"██";
540 LZ=1505:C=67:X=1:Y=0
550 LA=1543:K=67:A=-1:B=0
555 OA=A:OB=B:OX=X:OY=Y
560 POKE 53282,0
565 IF P1<20ANDP2<20THENGOTO599
570 PRINT"██████████████WINNER! PLAYER ";
575 IFP2=20 THENPRINT"2":GOTO 580
576 IFP1=20 THENPRINT"1":GOTO 580
580 PRINT"███████PRESS SPACE FOR ANOTHER GAME"
585 GETA$:IFA$<>" "THEN585
586 GOTO1
599 RETURN
600 REM SOUND EFFECT
610 FORI=15TO0STEP-3:POKE54296,I:POKE54276,129:POKE54277,15:NEXTI
615 POKE54273,40:POKE54272,200
620 POKE54276,0:POKE54277,0
699 RETURN
700 REM PLOT POINT
701 LZ=LZ+X+(40*Y):L=LZ:P=2:GOSUB 200
702 LA=LA+A+(40*B):L=LA:P=1:GOSUB 200
710 POKE(LZ),42:POKE(LZ+54272),0
720 POKE(LA),81:POKE(LA+54272),0
730 FORI=1TOSP:NEXTI
799 RETURN

READY.
```



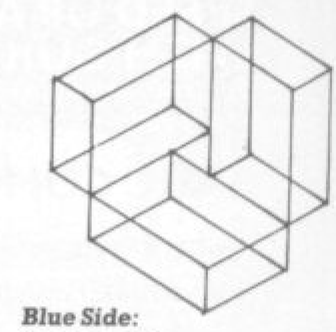
3D Shapes

by A Macielinski

Vic, Super Expander and Joystick

You'll like this program if perspectives fascinate you. It draws a wire model of any number of sides which you can mess around with: rotate either end of the drawing in both directions, shrink or expand them. So a four sided drawing gives you a cube, a three sided one with one end shrunk down to nothing gives you a pyramid etc. But the more sides you specify, the more like a cylinder the drawing becomes. You can also shrink a side down to nothing and beyond, which widens the scope a little.

Problem is that the drawing redraws itself after each instruction. So if it's got lots of sides, manipulating it becomes rather slow and the effect jumbled. You start losing lines if the drawing gets larger than the screen. The author uses both the keyboard and joystick for command input, which is clever, but didn't write them into the program. So here they are:



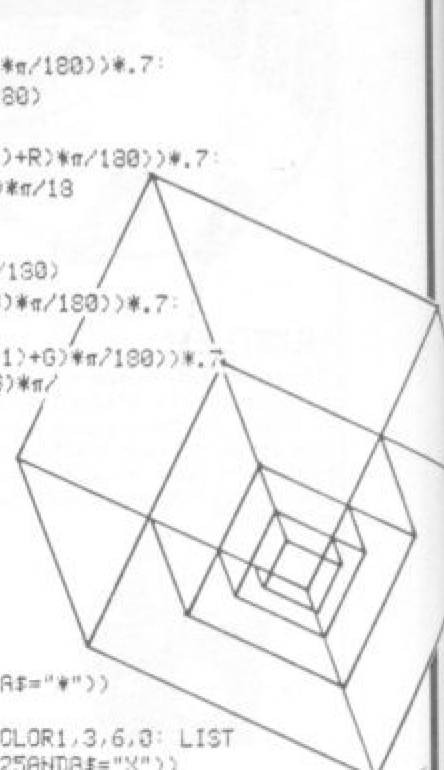
Blue Side:
R – rotate left
T – rotate right
Z – make side larger
X – make side smaller

Black Side:
F – rotate left
G – rotate right
N – make side larger
M – make side smaller

* – takes away a side
Q – quits program
/ – reruns program

Joystick Controls:
FIRE – adds a side
up, down, left, right

```
5 COLOR1,0,0,6
10 GRAPHIC0: INPUT"[CLR]
[BLU][CUD][CUD][CUD][CUD]HOWMANYSIDES[BLK]"; S: IFS<1THE
NS=4
20 GRAPHIC1: S=INT(S+.5)
30 X=1000: Y=600: X1=350: Y1=350: S1=400: S2=300: R=45: G=45
40 REM *DRAW**
50 FORF=1TOS+1
55 X2=(X+S1*SIN(((360/S)*F+R)*π/180))*.7:
X3=Y+S1*COS(((360/S)*F+R)*π/180)
56 :
60 X4=(X+S1*SIN(((360/S)*(F+1)+R)*π/180))*.7:
X5=Y+S1*COS(((360/S)*(F+1)+R)*π/18
0)
61 :
X7=Y1+S2*COS(((360/S)*F+G)*π/130)
65 X6=(X1+S2*SIN(((360/S)*F+G)*π/180))*.7:
66 :
70 X8=(X1+S2*SIN(((360/S)*(F+1)+G)*π/180))*.7:
X9=Y1+S2*COS(((360/S)*(F+1)+G)*π/
180)
71 :
75 DRAW3,X2,X3TOX4,X5
80 DRAW2,X6,X7TOX8,X9
85 DRAW2,X2,X3TOX6,X7
90 DRAW2,X4,X5TOX8,X9
95 NEXT F
100 Q=RJOY(1)
101 GETA$
102 IFA$=""ANDQ=0THEN100
110 S=S+((+1ANDQ=128)OR(-1ANDA$="*"))
125 IFA$="/"THENRUN
130 IFA$="Q"THEN: GRAPHIC0: COLOR1,3,6,0: LIST
131 S1=S1+((+25ANDA$="Z")OR(-25ANDA$="X"))
133 S2=S2+((+25ANDA$="N")OR(-25ANDA$="M"))
135 R=R+((+10ANDA$="R")OR(-10ANDA$="T"))
137 G=G+((+10ANDA$="F")OR(-10ANDA$="G"))
140 Y=Y+((-50ANDQ=1)OR(+50ANDQ=2))
160 X=X+((+50ANDQ=8)OR(-50ANDQ=4))
180 Y1=Y1+((+50ANDQ=130)OR(-50ANDQ=129))
200 X1=X1+((+50ANDQ=136)OR(-50ANDQ=132))
220 SCNCLR: IFS<1THENS=1
230 GOTO50
```



The best accessory for your micro



ONLY £34·49 (P+P £2.50)

The Rotronics Portable Case

Here is the ideal portable work station for home, school or work. Specially made for most home microcomputers, it contains your VIC 20 or CBM 64 within a smart executive style case with removable lid for convenience in use.

The individually tailored foam insert securely protects your micro and cassette recorder (both types) during transit. Additional storage space in the lid holds manuals and up to twenty cassettes. A scalpel is provided to modify the insert for expansion units and an alternative insert can be supplied if you change your hardware in the future. The case is also available with uncut foam inserts.

All components remain fully operational within the case via inter-connections routed between the double layers of foam, so there are no unsightly leads.

This is the first case designed for easy use with each component positioned for convenient operation. The overall dimensions are 138mm x 700mm x 363mm.

VIXEN RAM Cartridge

Versatile unit with switchable memory blocks. Allows standard 16K BASIC memory expansion, or RAM to be relocated for machine code use. Two VIXENs may be combined (using the Motherboard) and set so as to fully expand the VIC to 32K. £34.45 (p+p 50p)

VIXEN Motherboard

Allows up to four cartridges to share the VIC 20 expansion connector. Switches allow two of these ports to be switched in or out, or to be relocated in memory. The VIXEN also incorporates a socket which accepts software in PROM form: a utility PROM is already available (not supplied) which adds 18 new and useful commands to VIC BASIC. £31.95 (p+p 50p)



Order Form

CU/1/84

Trade Enquiries Welcome

Please send me (tick appropriate box)

- ☐ Rotronics Portable Case at £36.99 (inc. £2.50 p+p) for VIC 20/CBM 64/Uncut Foam (please delete as necessary)
- ☐ Vixen 16K Switchable RAM Cartridge at £34.95 (inc. 50p p+p)
- ☐ Vixen Switchable Motherboard at £32.45 (inc. 50p p+p)

All prices inclusive of VAT

I enclose a cheque/PO for £__________ made payable to SMT.

Name__________

Address__________

SMT

Please allow 28 days for delivery. Send to (no stamp required) FREEPOST Greens Norton Towcester Northants NN12 8BR

Mr. Chip
SOFTWARE

COMMODORE 64 GAMES AND UTILITIES

JACKPOT 64
At last its here, specially written for the 64, by the author of "JACKPOT" the ultimate Fruit Machine program for the Vic **£5.50**

WESTMINSTER
A game for up to four players, can you lead the party of your choice and win the general election. You tour the 60 constituencies (seats) buying votes when you can (just like the real thing), this must be one of the first board-type games specifically written for the computer. Why play on your own. Have fun with your family and friends playing WESTMINSTER **£5.50**

RED ALERT
A game for 1-4 players, with sound and graphics, Make money in casinos, commit robbery, hide from the police, hire secret agents, (some of whom can be treacherous), negotiate for weapons, find and attack the secret rocket base tolaunch the missile, and watch the havoc and destruction caused. There is no turning back from "RED ALERT" **£5.50**

WH££LER DEALER
A game for two to twenty players. Become a tycoon of the motor trade; you must obtain gearboxes, tyres and engines to produce cars for sale. Form syndicates, buy and exchange parts, buy dealerships; but be careful, you may become bankrupt and have to liquidate. Find out what you're made of; have you got what it takes to become a WH££LER DEALER? **£5.50**

LUNAR RESCUE
Our new version: avoid the asteroid belt to rescue the stranded scientists, then fight your way back to the mother ship; fast reactions are required to safely land and dock your lunar module (available now) **£5.50**

CHIPMON
Contains a one- or two-pass Assembler, Disassembler and Monitor. A programming aid for the development of machine code programs and routines on the CBM 64 **£12.50**

BANK MANAGER 64
As our Super Bank Manager, but for the 64 **£7.50**
Now available on disk with added facilities **£10.00**

PURCHASE LEDGER
Easy to use, single entry, handles 400 invoices per month, Gross/Nett purchases, V.A.T. **£14.50**
Disk Version **£17.00**

SALES LEDGER: As Above **£14.50**
£17.50

VIC 20 GAMES AND UTILITIES

JACKPOT
This is it, the ultimate fruit machine program for the Vic, with nudge, hold and re-spin; 100% machine code.
"JACKPOT is a beautifully written simulation giving superb graphics, animation and use of sound."
—*Home Computing Weekly No 20, 19/7/83* **£5.50**

KWAZY KWAKS
Accuracy and speed are required for this shooting gallery, superb use of colour and graphics in this new and challenging game from the author of JACKPOT. 100% machine code, joystick and keyboard control. **£5.50**

PACMANIA
Choose your own game from the following options — difficulty 1-3, speed 1-3, size of maze 1-3, visible or invisible maze, still or moving power pills. Define your own key controls, any combination. If this is your type of game, then this is the one for you. For the 3K expanded VIC only **£5.50**

BUGSY
This is a Minefield with a difference! as you step on the stones whilst collecting purple boxes which give you both time and points, they disappear from beneath your feet. DO NOT DESPAIR! 'Bugsy' will randomly replace the stones but avoid bumping into him or it's sudden death! An original, compulsive and challenging game. Joystick only. **£5.50**

MINI-ROULETTE—PONTOON—HI-LO
Three great games of chance for the VIC. Try to beat the computer; hours of fun, full colour, sound effects and tunes **£5.50**

SUPER BANK MANAGER — A full feature version; any memory size, but needs 3K expansion **£7.50**

Send cheques/POs to

MR. CHIP SOFTWARE
Dept CU, 1 Neville Place, Llandudno, Gwynedd, LL30 3BL. Tel: 0492 49747

* —**Send large s.a.e. for free colour brochure, including RABBIT SOFTWARE at £5.00**

Full documentation with all utility programs

DEALER ENQUIRIES WELCOME

Multitone *by David Gardiner*

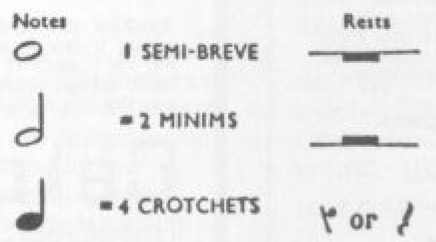
```
40 DIMO(250): GOSUB1470: M$="S"
130 PRINT "[CLR][CUD][CUD][CUD][CUD][CUD][CUD][CUD][CUD]"
170 PRINT "[GRN]A-F:VOLUME."
180 PRINT "[BLU]Z:1ONM:1OFF"
200 PRINT "X:2ON,:2OFF"
210 PRINT "C:3ON.:3OFF"
220 PRINT "V:4ON/:4OFF"
260 PRINT "[RED][RVS]•[RVO]:SUSTAIN."
270 PRINT "[RVS]T[RVO]:DIMINISH."
275 PRINT "£:RECORD."
276 PRINT "-:PLAY."
277 PRINT "+:STOPPLAY/RECORD."
280 PRINT "[RVS]][RVO]:QUIT."
510 S1=36874: S2=36875: S3=36876: S4=36877: V=36878: C3=240: A2=237: B2=239
610 C1=195: D1=201: E1=207: F1=209: G1=215: A1=219: B1=223: C2=225: D2=228: E2=2
31: F2=232: G2=235
755 PRINT "[HOM][CUD][CUD][CUD][CUD][CUD][CUD][PUR]MODE:"; M$
757 OT=PEEK(197)
760 IFOT=64ANDM$="D"THENPOKE S1,0: POKE S2,0: POKE S3,0: POKE S4,0: GOTO757
765 IFOT=64THEN757
790 IFOT=0THENP=C1
800 IFOT=56THENP=D1
810 IFOT=1THENP=E1
820 IFOT=57THENP=F1
830 IFOT=2THENP=G1
840 IFOT=58THENP=A1
850 IFOT=3THENP=B1
855 IFOT=48THENP=C2
860 IFOT=9THENP=D2
870 IFOT=49THENP=E2
880 IFOT=10THENP=F2
890 IFOT=50THENP=G2
900 IFOT=11THENP=A2
910 IFOT=51THENP=B2
920 IFOT=12THENP=C3
925 IFOT=32THENP=0
926 IFOT=6THENGOSUB1330
927 IFOT=61THEN1400
928 IFOT=5ANDR$="#"THENR$="": PRINT "[HOM]"
929 IFR$="#"THENGOSUB1350
930 IFOT=17THENR=4
940 IFOT=41THENR=8
950 IFOT=18THENR=12
960 IFOT=42THENR=15
962 IFOT=7THENM$="D"
964 IFOT=62THENM$="S"
965 IFOT=23THEN1150
970 GOSUB1050
1005 POKE V,R: IFA=0THENPOKE S1,0
1010 IFA=1THENPOKE S1,P
1015 IFB=0THENPOKE S2,0
1020 IFB=1THENPOKE S2,P
1025 IFC=0THENPOKE S3,0
1027 IFC=1THENPOKE S3,P
1030 IFD=0THENPOKE S4,0
1035 IFD=1THENPOKE S4,P
1040 GOTO755
1050 IFOT=33THENA=1
1060 IFOT=26THENB=1
1070 IFOT=34THENC=1
1080 IFOT=27THEND=1
1090 IFOT=36THENA=0
1100 IFOT=29THENB=0
1110 IFOT=37THENC=0
1120 IFOT=30THEND=0
1140 RETURN
1150 POKE S1,0: POKE S2,0: POKE S3,0: POKE S4,0: POKE V,0: PRINT "[CLR][BLU]"; :
 END
1330 X=1: FORT=1TO249: O(T)=0: NEXT: PRINT "[HOM]"X
1350 O(X)=P: X=X+1: R$="#": IFX=250THENR$="": PRINT "[HOM]": RETURN
1390 PRINT "[HOM]"X: RETURN
1400 FORT=1TO249: POKE S1,O(T): POKE S2,O(T): POKE S3,O(T): FORL=1TO150: NEXT
1416 GETW$: IFW$="+"THENR$="": PRINT "[HOM]": GOTO755
1420 PRINT "[HOM]"T: NEXT: POKE V,0: R$="": PRINT "[HOM]": GOTO755
1470 PRINT "[CLR][CUD][CUR][CUR][CUR][CUR][CUR][CUR][RVS][BLU]MULTITONE"
1490 PRINT "[CUD][CUD][RED][CUR][CUR]BYDAVIDGARDINER": FORT=1TO999: NEXT: RETURN
```

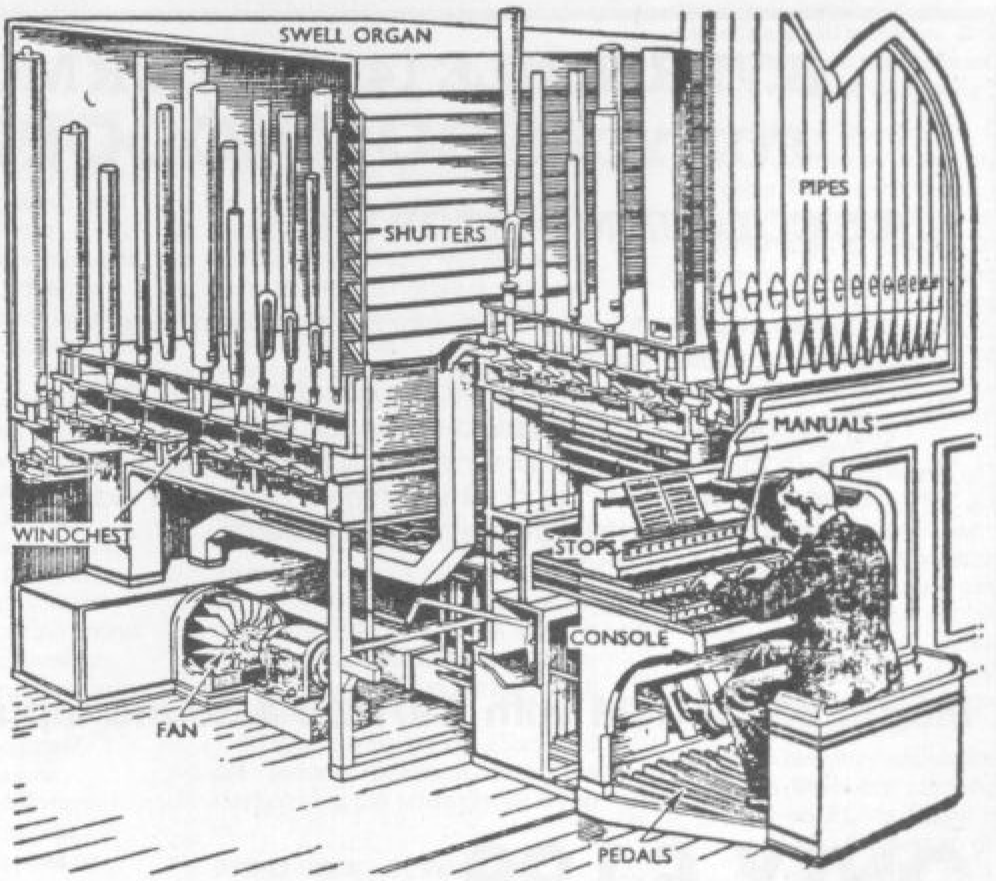
Unexpanded Vic

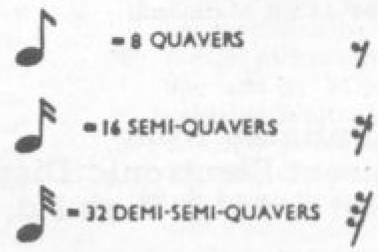
Multitone turns your unexpanded Vic into a two-octave organ, and uses the computer's memory to store and replay your opus. It's a bit limited because you can only store 250 notes; but a nice feature is a running display which tells you how many notes you've got left.

David has used the Vic's four different sound channels; he's provided four volume settings and two modes, Sustain and Diminish. Sustain holds a note until you press the space bar whilst Diminish stops it as soon as you take your finger off the key. Trouble is, you won't be able to do any nifty fingerwork, like playing a few fugues. That's not David's fault, just that the Vic's keys are not very responsive.

Also provided are keys for record and playback ... but we won't bother listing them as all the relevant info is in the program.







Arcade software for COMMODORE 64
Action-packed 100% Machine Code





£6.95
"There in the sky I saw the screaming alien birds. They had come to invade our planet. People ran in wild panic and desparation in some vain hope of escape. But there was no escape. The aliens swooped out of the sky killing anyone in their path. I alone decided to stay and fight, but then the eggs hatched and the true horror began..." A fast-moving Galaxian type arcade game with Hall of Fame and bonus lives. Uses one joystick.

£6.95
Scale the ladders to get your Space Hammer but watch out for the homicidal Meanies", the slightest touch and you'll be electrocuted. Once the Hammer is in your hands you can start to rid the world of the meanies: chase them up and down the ladders, through the escape door, lure them into holes dug with your space hammer. When you trap one, rush over and BONK him on the head. But Hurry! If you loiter he will climb out, fill in the hole, and then home in on you, flashing in anger! To add to your problems your oxygen is running out and the meanies move fast the more you kill. A superb arcade-style game with Hall of Fame. Uses one joystick.

LATEST RELEASE — AVAILABLE NOW!
CYBERMEN
£6.95

You, our hero, attempt to remove the platinum from the Cosmic space station inhabited by the Cybermen. Programmed to destroy all intruders, their duty is to protect the precious metal. For safe keeping this has been distributed throughout the random maze of corridors of which the space station consists. Not only do the Cybermen home in on you but you will be electrocuted if you touch the maze walls. Your phaser will kill the Cybermen but the corridors are also patrolled by the indestructible overseer who possesses the unearthly power of moving through walls.

All orders despatched by return first class post.
Callers and Trade enquiries welcome.
Dept CU2, 2 Glensdale Street, Leeds, LS9 9JJ.
Telephone (0532) 480987

J. MORRISON (MICROS) Ltd.
Suppliers of quality machine code software since 1978

Superbase

TRANSFORMS THE COMMODORE 700 OR CBM 8096 INTO A FULL-FEATURED PROFESSIONAL DATABASE SYSTEM! WITH UP TO 1000 CHARACTERS PER RECORD ON UP TO FOUR SCREENS... AND UP TO 128 ITEMS PER RECORD, DEFINABLE AS KEY, TEXT, NUMERIC, CONSTANT, RESULT, OR DATE... IN FILES OF UP TO 16M CHARACTERS! SUPERBASE EVEN HAS A SPREADSHEET AND CALCULATOR CAPABILITY, AND CALENDAR FUNCTIONS, EASY INPUT FROM WORD-PROCESSOR AND DATA FILES, BOTH MENU-DRIVEN AND PROGRAM OPTIONS, SORTING/SEARCHING WITH MULTIPLE CRITERIA, FULLY DEFINABLE REPORT AND SCREEN FORMATS, TRANSACTION HANDLING... SUPERBASE IS ESSENTIAL IF YOU WANT THE MOST FROM YOUR COMMODORE COMPUTER!

● SPECIAL OFFER PRICE ~~£517.50~~ £425!

Superscript II

SUPERSCRIPT II IS THE COMPLETE DOCUMENT PREPARATION & STORAGE SYSTEM, MAKING OPTIMUM USE OF MEMORY & DISK SPACE... AND IT'S AVAILABLE NOW FOR THE COMMODORE 700 COMPUTER, WITH A HOST OF NEW FUNCTIONS, INCLUDING CALCULATOR, ARITHMETIC, BUILT-IN SPELLING CHECKER, AS WELL ALL THE OUSTANDING FEATURES OF THE ORIGINAL SUPERSCRIPT... IN SHORT, IT OFFERS ALL THE ADVANTAGES OF A PROFESSIONAL WORD-PROCESSING SYSTEM, AT A PRICE THAT CANNOT BE IGNORED!

● SPECIAL OFFER PRICE ~~£517.50~~ £425!

Master

MASTER 700 IS A TOTALLY NEW CONCEPT... A COMPLETE PROGRAMMING AND SYSTEM DEVELOPMENT PACKAGE, AND IT'S AVAILABLE NOW FOR THE NEW COMMODORE 700 COMPUTER. MASTER ADDS 85 NEW COMMANDS TO CBM BASIC, INCLUDING PROGRAMMER'S TOOLKIT, BUSINESS BASIC, KEYED DISK ACCESS, MULTI-SCREEN MANAGEMENT, USER-DEFINABLE INPUT ZONES, REPORT GENERATOR, 22-PLACE ARITHMETIC, DATE CONTROL, STRING FUNCTIONS, DISK DATA COMPRESSION, SCREEN PLOTTING, SCREEN DUMP, AND MORE... IN FACT EVERYTHING YOU NEED TO PROGRAM THE CBM 700 TO TOP PROFESSIONAL STANDARDS! SUPPLIED AT £339.25, WITH USER REFERENCE MANUAL, QUICK REFERENCE GUIDE AND DEMO PROGRAMS. ALSO AVAILABLE FOR THE CBM 64 (~~£143.75~~ £115!) AND CBM 4032/8032/8096 (~~£339.25~~ £225!)

THESE ARE JUST SOME OF OUR FINE SOFTWARE PRODUCTS FOR COMMODORE COMPUTERS... PLEASE TELEPHONE OR WRITE FOR FREE DATA SHEETS! PRICES SHOWN INCLUDE 15% VAT AND ARE CORRECT AT TIME OF GOING TO PRESS. ORDER BY POST/TELEPHONE/PRESTEL, USING CHEQUE, ACCESS, BARCLAY CARD OR OFFICIAL ORDER. TELEPHONE 01-546-7256 FOR SAME-DAY DESPATCH! POST FREE EXCEPT ON CREDIT/OVERSEAS ORDERS. (REF A24)

Calco Software

LAKESIDE HOUSE, KINGSTON HILL, SURREY KT2 7QT TEL 01-546-7256

A VERSATILE 14" COLOUR MONITOR *(WITH SOUND)* FOR YOUR COMMODORE *(OR ANY OTHER MICRO)*

A JLC COLOUR MONITOR WILL:



- ★ provide improved display clarity and performance for clearer, crisper images
- ★ be a neat, compact and professional product that represents remarkably good value for money
- ★ have adaptability with a simple input connection switch
- ★ be compatible with all popular micros and most video recorders, viewdata adapters and cameras
- ★ be made in England

Model 3373FCSM with CV/RGB & sound inputs

SPECIAL PROMOTION

A limited number of purpose built **14" colour TV & RGB/CV monitor combined**

AT ONLY £199 +VAT

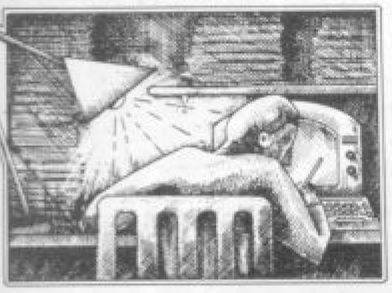
ONLY £199 + VAT

(P&P £8 UK Mainland)

All leads £8

Available from
Direct Electronic Displays
Unit 7, 551A High Rd, London N17 Tel: 01-808 8847

TOMMY'S TIPS



It seems to be a long time since I indulged in one of my pre-Tip homilies. Well, I'm about to indulge myself (I don't care, I get paid by the word anyway!) Once again Tommy is moaning about something – not for a change Commodore's documentation, or duff dealers, or even the price of a pint in the Tommy Arms.

It is a plea from the heart from me to you: please try to write your letters to me *neatly*. Poor old Tommy's eyesight is under great strain after too many all-night debugging sessions, and some of the spidery scrawls I get are almost illegible (certainly after the 9th pint at the TA. So please, if you are going to write, do your best to make sure I can read them easily. *(And if we don't think Tommy's bifocals will stand the strain, we won't let the queries get past the wastpaper basket. So be warned: — Ed).*

Dear Tommy **I am at present considering the purchase of a disk unit for use with my Vic. I have many 16K programs which I would like to transfer to disk for convenience and speed of loading. These cassettes are mainly in machine code and are protected. Is there a means or program available to copy these programs to disk in a similar way to the various tape back-up programs that are on the market?**

But the idea of protecting a program is to *stop* people making copies! Some games manufacturers now offer games on disk *or* tape, and may be willing to send you a disk version if you send the tape back to them.

On the whole though, if that is the only reason you want a disk you would be best to stick to cassette. The advantages of the disk only become apparent if you are manipulating data files, or developing your own programs where you are constantly saving and loading the program. After all, any decent game should last a reasonable length of time; and who cares about a minute's loading time compared with half an hour's playing time?

Dear Tommy **For some time I have been confronted and confused by a problem with the use of files with the Vic. Having created a file by using a 'write-to-file' program I find it impossible to correct or add to the file without rewriting the whole file. For example, if one sets up a file of names and telephone numbers for say 50 people, and one person's telephone number changes, is it necessary to rewrite the whole file or can it be updated? Also, can a new name be added to the list in any place (for alphabetical order), at the end of the file, or at all?**

I presume that you are talking about cassette files here. With a disk it is possible to set up what are called random access files, where you can access *any* record on the file and read or update it as required. Unfortunately, with cassette files you are stuck with sequential files; and they can only be read or written all in one go. To be able to use random access reliably on a cassette system requires some quite expensive hardware!

But all is not lost, provided that your file is short enough to be held in memory all at once. You just read the whole file into a Basic array; there you carry out all your insertions, deletions, amendments and sorting. Then you write the whole file back on to another cassette (keeping the old tape as a backup).

The only problem is that if you are using string data (which is almost certain to be the case), arrays will result in garbage-collection delays becoming noticeable – or even unpleasant, depending upon how many array elements you have. Don't forget that it is the number of string arrays elements which determines the amount of time the computer goes dead for.

Actually, this reminds me of a suite of business programs produced by a major software house when the Pet was first introduced. Everything was on cassette with all the files being read into memory, manipulated, and then written back. The trouble was that because of the garbage collection the thing stopped for minutes at a time – and was actually slower than a manual system! If you are using fairly small files (50 elements will cause no problems at all) this is quite a viable way of manipulating tape files.

Dear Tommy, **is it possible to delete program lines after they have been read in and then make use of the space? For instance, DATA statements are completely superfluous once read. If they could be wiped out before the main part of the program began to run, say, the space might perhaps be used for variable storage.**

The best way of handling this is to chain two programs together. It *is* possible to write a program in assembler to delete lines; but chaining has a number of other advantages. You can for instance put *all* the initialisation section of the program into one new program, and then chain on to the main part.

Chaining is the process of moving from one program to another, keeping all the variables. The Commodore manual tells you how to do it:

100 LOAD "PART 2"

Yes, that's all there is to it: a LOAD statement in a program will load and run another program, keeping all your variables.

There is one small snag, of course. Incredibly, the manuals do not point out that *the first program has to be larger than the second!* Otherwise the second program will write over the first program's variables.

Worse still, Basic will then overwrite the new program thinking it's part of the variable space. Still, the chances are that if you split a program into an initialisation section and a main part that the first will be much smaller than the second. So what do we do about it?

There are two memory locations which together form a pointer called VARTAB telling Basic where the start of variables is. On the Vic and the 64 the relevant addresses are 45 and 46. By altering these we can fool Basic into thinking that a program is larger than it really is.

So this is what we do. First, load the second program from the keyboard in the normal way. Type in ...

PRINT PEEK(45), PEEK(46)

Say we get the values 125 and 23. Now load the first program. What we are going to do is to add a statement at the start of the program to modify the value of these two locations. This will force Basic to start the variables table further down memory, thus leaving room for the second program.

In fact I normally increase the values a bit more to allow room for the second program to get a bit larger. This wastes a bit of memory, but saves having to alter the first program every time I add a few lines to the second program.

In this case I might add 2 to the value of PEEK(46), making 25. This in fact reserves an extra 512 bytes of memory.

So at the start of the first program, we add a new line saying ...

1 POKE 45,123: POKE 46,25

This must be done *before* you use any variables at all. You can now chain from program 1 to program 2 at will. You can also chain to any number of other programs, as long as those two POKEs in the first program allow enough room for the largest program in a series.

If you are still developing program 1, it is best not to SAVE it after it has been run. This is because Basic will save *all* the enlarged program – which will not do any harm, but it will make future loading and saving much slower. If you want to modify program 1 it is best to load a fresh copy, alter it and then save it again before running it.

Dear Tommy, **Could you please explain if there are any significant differences (besides price) between cheap and expensive RAM packs for the Vic?**

There are a number of features which you may or may not find on different RAM packs; and, as with cars, it is not always the most expensive unit which has the most features. Apart from these, some units are more reliable than others; but again this can bear little relationship to the price. The only way to find out about this is to conduct a survey amongst your friends and acquaintances.

Here is a list of some of the features you might look for. It is by no means complete; but only you can decide which are important to you.

- The most important parameter is of course the actual size of the expansion, which can range from 3K to 27K. That's the most obvious factor in the price of the unit.
- The memory expansion port is also used for cartridges and add-on ROMs. Some memory units hog the port so that nothing else can be plugged in; better units have a socket which allows other units to have access to the Vic.
- A ROM socket can hold one of the add-on ROM products available (such as VICMON).
- As many games do not check the memory size of the Vic, it may be a good idea to have the size of the expansion controllable by means of switches.

Tommy

Dear Tommy **Would you please inform me if there is any possible way of accessing the 3K expansion contained in the Super Expander cartridge *without* accessing its extra functions. It is not possible to play 'extended memory required' games by plugging the cartridge in as it stands, as the built-in functions of the cartridge disable the game.**

This is fortunately quite simple to do by two SYS calls:

SYS 64850
SYS 58232

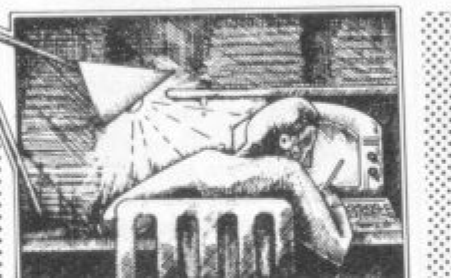
Unfortunately giving these commands in effect carries out the NEW command; so they cannot be incorporated into a program, but have to be entered each time you turn the Vic on.

Dear Tommy, I am a Radio Amateur (my call sign is G6LIA) and I have been using my Vic-20 for the transmission and reception of RTTY signals via a FLL terminal unit. I have also been successfully experimenting with the transmission and reception of the Pet ASCII and standard ASCII codes using the same methods, and have linked two Vic-20's and a 64 with nearly total control over both machines over many miles.

I do have one problem, though: I have been unable to place into memory a program received from the transmitting station for subsequent transfer to tape. Could you please tell me how I receive data via the RS232 port, place it on to the screen, and into memory. I have also included a listing of the program that I have used and you will notice that the main part of it is as published in the reference guides.

It is a pity that you are using tape, because with a disk it would all be so easy! You can 'write' a program file by opening it with a secondary address of 1. Then to copy the program you just have to send the start address, the end address, and the contents of each memory location in the program in memory.

It is not so easy with tape. There are a number of things you can try, but a bit of experimenting will almost certainly be necessary. The first possibility is giving LOAD and SAVE commands specifying the RS232 port (that is device 2 instead of device 1); but you may have problems with synchronising the



two machines. Try using the LOAD command first.

Failing that you could rewrite your communications program in assembly language. Then you can send the start and end addresses and the data; and have the assembler program set up the Basic pointers ($2B–$2C for start of the program, $2D–$2E for end) and put all the data into memory. When the program has been received you can return to Basic, type CLR and save the program in the normal way.

The last method, which is the least elegant, is this. You have to insert the following bit of program at the *start* of the program you are going to send, and you have to load it into the receiving machine too:

```
100 S=PEEK(43)+PEEK(44)*
    256: E=
    PEEK(45)+PEEK(46)*256
110 OPEN
    200,2,CHR$(2)+CHR$(0)
120 PRINT
    #2,CHR$(PEEK(45));CHR$(
    PEEK(46));
130 FOR I>S TO E: PRINT
    #2,CHR$(PEEK(I));
140 NEXT: CLOSE 2: END
200 POKE 45,0: POKE
    46,PEEK(56)-1: CLR
210 OPEN
    200,2,CHR$(2)+CHR$(0)
220 GET #2,A$: GET #2,B$:
    E=ASC(A$)+256*ASC(B$)
230 S=PEEK(43)+PEEK(44)*
    256
240 FOR I=S TO E: GET #2,Z$;
    POKE I: ASC(Z$)
250 NEXT
260 POKE 45,ASC(A$): POKE
    46,ASC(B$): CLR
```

I should point out straight away that this program has been written off the top of my bald pate; and as I do not have access to the equipment to try it out on, I cannot give the usual guarantees. So be prepared to have a fiddle with it!

Lines 100 to 140 are the "transmit" section. Line 100 sets S and E, which are the start and end addresses of the program respectively. Line 110 opens a file to the RS232 port, and line 120 sends the end address to the RS232 port.

Both programs should start at the same address. So if you have one normal Vic and one with an expansion, the receiving computer may store its program in a different address. Then you will have to offset E to allow for this.

Line 130 sends the program and line 140 finishes things off. The rest of the program is the receive section. Line 200 moves the variable table for this program far enough up memory to allow room for the 'new' program to be POKEd into position underneath it. Line 210 opens the file to the RS232 port, and line 220 gets the end address of the program.

Line 230 picks up the start address and line 240 carries out the actual reception of the program. Line 260 then resets Basic's 'end of program' pointer to the correct value.

Notice that this part of the program in the receiving computer is overwritten. But as each memory location is overwritten with the same data (because the transmitting program has the same lines at the start), no damage is done.

To use the program, type RUN 200 in the receiving machine, then RUN the program in the transmitting machine. When everything has finished, you should find that the transmitted program has miraculously appeared in the receiving machine.

By the way, from the listing you sent I see that you have not spotted the bug in the listing in the *Reference Guide*. Line 360 says:

```
360 IF (PEEK(37151) AND 64) =
    1 THEN 360
```

The trouble is that something ANDed with 64 is going to give a value of either 0 or 64! Replace the line with:

```
360 IF PEEK(37151) AND 64
    THEN 360
```

Dear Tommy, First the tale of woe! I bought an Arfon expansion board at about the time they ceased to trade. I did not know this and had written asking for instructions, a circuit diagram and details of the promised printer. In December 1982 *Vic Computing* said Arfon were back care of Torch Computers. In May 1983 I received a letter form Torch saying this was "a product line in which we have no involvement". Meanwhile, as they say, the unit was behaving well.

Now the problem! This week I needed access to the I/O port which was fully occupied providing power from the Arfon power pack to the Vic and the expansion board. I therefore disconnected the Arfon supply and reinstated the CBM unit only to find on power-up that all I could get was 3583 bytes and not my 27K. The Arfon appears to reach the parts that CBM cannot! The Arfon plug seems to feed pins 10 and 11 of the user port. Can you suggest: (1) why the mother board does not want to work with the CBM unit, (2) how to overcome this problem (apart from messing about to get the supply and my other work into the same plug)

Your problem stems from the fact that the Arfon unit supplies two lots of power; 9V ac to the Vic and 5V dc to the expansion board. When you use the CBM unit you are only providing the 9V ac; there is no power connection between the Vic and the expansion board, so the cartridge cannot work. You will be pleased to hear that there are three ways of overcoming this problem, as follows:

1 The easiest method is just to switch on *both* power supplies, making quite sure the lead from the Arfon to the User-port is NOT connected. The drawback is that you must switch off both power supplies before changing any of the cartridges otherwise damage may result. If having two power supplies is unacceptable then you must use one of the other two methods, both of which require some soldering.

2 To operate using the CBM unit only, find the wire link at the top lefthand corner of the expansion board connecting points B and C. Add a new link to connect points B and A (or C and A). The board will now get its power from the Vic. This method can only be used if you are running no more than two or possibly three cartridges at once; more than this will overload the CBM power supply.

3 The third solution will enable you to run all seven sockets and the Vic from the Arfon unit. Unscrew the box covering the Arfon power unit; replace the white power leads to the User-port with a longer piece of cable terminated at one end with a Vic power plug (cut the cable off the CBM unit if necessary). By routing this cable through the small round hole in the righthand side of the Arfon unit (before soldering it), you can plug the cable into the normal Vic power socket; leave the Vic's power switch in the ON position all the time and just use the Arfon mains switch. ■



More WINNING GAMES from LYVERSOFT

LUNAR RESCUE (48K SPECTRUM)
A team of research scientists are trapped on the moon and you have to pilot the rescue pod from the mother ship and ferry them back safely. But you have only space for one scientist at a time. 100% M/C action with super smooth HI-RES GRAPHICS AND JOYSTICK OPTION.

LIBERATOR (16K/48K SPECTRUM)
This game tests your aim and reactions as you command a gunsight on a homeward bound space freighter. Your cargo is the royal treasures of the empire and many people want them.
A machine code presentation that should have you hooked.

THUNDERHAWK (48K SPECTRUM)
Based on the popular arcade game Pheonix. This 100% full colour epic pitches you against the evil Albertrons who are set to destroy your race, five levels of fast action bring you to the command centre of battle fleet, can you finish the job. WITH JOYSTICK OPTION.

GOLF (48K SPECTRUM)
Using M/C graphic routines, a game to absorb the keen novice and the scratch player. Play on a 9 or 18 hole course, with full selection of clubs. Along the greens and fairways hours of addictive sport can be had.

PICTURE PUZZLE (DRAGON 32)
With HI RES graphics and 100% M/C. You are set the problem of putting the picture back together. Test your skill against the dragon 32 computer. A game guaranteed to hold you spell bound for hours.

ANDROID INVADERS (DRAGON 32)
In a change of tactics the beings beyond the stars have developed an android of human form to do their dirty work. And with the aid of sensor jamming they may prove formidable. Using full colour, M/C, hi-re graphics this game can offer up to 21 levels of combat.

VOYAGER (VIC 20 8 OR 16K)
The mission is simple, but its completion is far from being so. As captain of starship you have all the best facilities at your disposal. Unfortunately the klingons oppose you. A great M/C version of this classic computer game.

SPHINX (VIC 20 8 OR 16K)
A riveting, full colour graphic adventure. That pits you against the spells and guardians of the tomb. In your quest to uncover the treasure of the pharoahs. This game will have you enthralled.

BIRD OF PREY (BASIC VIC 20)
Evil baron von fritz is out to kill his cousin, the much loved Prince Rupert. The Baron intends to throw the prince from his plane into the sacred fire pit. But you the eagle of the north will make every endeavour to save your friend Prince Rupert. With colour, sound, this M/C game is a must.

ALSO AVAILABLE:
Demon Driver Basic VIC20 — £5.95
Lunar Rescue Basic VIC20 — £5.95
Space Assault 3 or 8 VIC20 — £5.95
Apple Bug/Crazy Climber Basic VIC 20 — £5.95
Nuclear Attack/Grand Prix Basic VIC20 — £5.95
Hearts & Diamonds/Hi-Lo Basic VIC20 — £5.95
Machine Code Monitor VIC20—£14.95
Hangman/Super Docker ZX81-16K £4.95
Bouncing Gorillas ZX81-16K—£4.95

all games £5.95

66 Lime Street, Liverpool L1 1JN 051-708 7100

- [ ] Lunar Rescue
- [ ] Golf
- [ ] Voyager
- [ ] Liberator
- [ ] Picture Puzzle
- [ ] Sphinx
- [ ] Thunderhawk
- [ ] Android Invaders
- [ ] Bird of Prey

Please debit my Access/Barclaycard (delete as necessary)
Card Number ____________
I enclose Cheque/PO for £
Name ____________
Address ____________

Free Postage mainland UK only

ANIROG SOFTWARE

COMPUTER GAMES OF TOMORROW AVAILABLE

NOW!

AS SEEN ON T.V.!





HEXPERT



MOON BUGGY



SKRAMBLE



3D TIME TREK

COMMODORE 64

NEW

GALAXY
AVOID CAPTURE BY THE ALIEN MOTHER SHIPS TRACTOR BEAM AS THE FIGHTERS DIVE BOMB YOU. 100 SCREENS WITH A TWO PLAYER OPTION. K.B./J.S. £7.95

KONG K.B./J.S. £7.95
4 SCREENS WITH BRILLIANT ANIMATED GRAPHICS.

SKRAMBLE J.S. £7.95
6 SECTORS TO TEST YOUR SKILL.

HEXPERT J.S. £7.95
TRAIN BERT TO BE HEXPERT ON THIS 3D HEXAGONAL PYRAMID.

MOON BUGGY J.S. £7.95
MANOEUVRE YOUR PATROL CRAFT OVER GIANT POT HOLES AS YOU DEFEND THE MOON BUGGY FROM ALIEN ATTACK.

FROG RUN K.B./J.S. £5.95
A POPULAR ARCADE GAME. FUN FOR THE WHOLE FAMILY.

3D TIME TREK K.B./J.S. £5.95
SPECTACULAR 3D GRAPHICS STAR TREK GAME.

DUNGEONS K.B. £6.95
ENTER THE REALMS OF FANTASY IN THIS ROLE PLAYING GAME.

DARK DUNGEONS K.B. £6.95
2ND IN THE SERIES OF FOUR. DEFINITELY NOT FOR THE FAINT HEARTED.

NEW APPROVED GAMES FOR THE STACK LIGHT RIFLE

INDIAN ATTACK £5.95
COSMIC COMMANDO £5.95
VENGEANCE OF ZENO £5.95

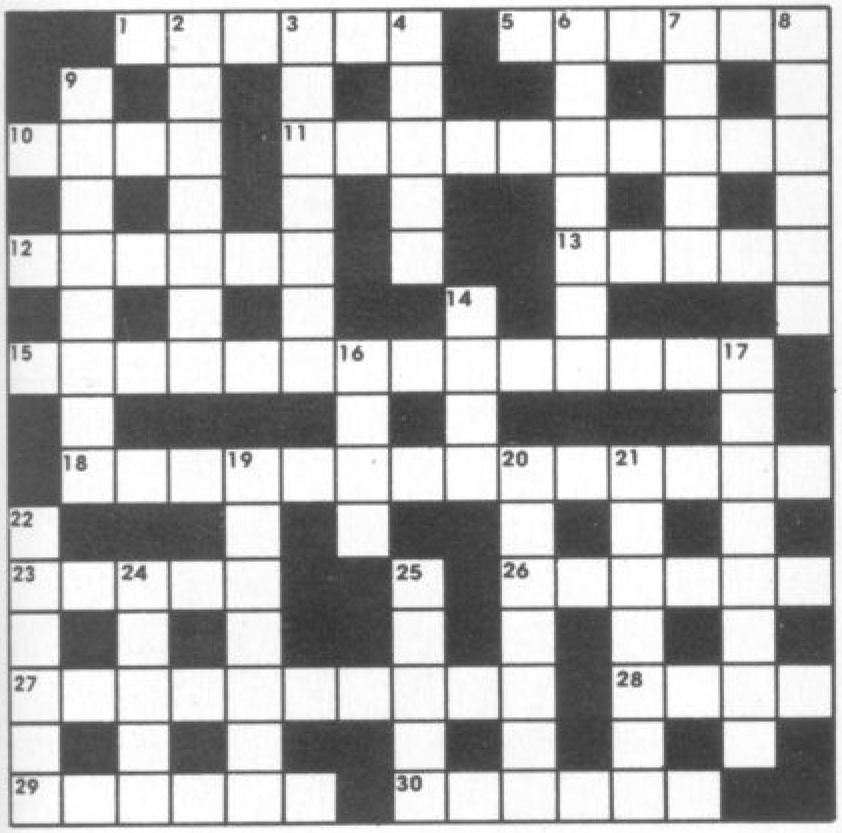
24 HR. CREDIT CARD SALES HORLEY (02934) 6083
PAYMENT BY CHEQUE, P.O., ACCESS/VISA
8 HIGH STREET HORLEY, SURREY.
Overseas 50p post & packaging

TRADE ENQUIRIES WELCOME
29, West Hill, Dartford, Kent. (0322) 92513/8

Another chance to win yourself a Vicwear sweatshirt!!!

Prizes go to the first five correct entries to arrive by 1 February at: Commodore User, The Metropolitan, Enfield Road, London N1 5AZ. (Please mark your envelope Crossword Competition.) All completed crosswords must be accompanied by an entry form – (remember to state your size, S,M,L,XL and preference).

Answers, winners and a new contest in next month's issue. Meanwhile, happy solving. Friends and accomplices of Paradox are excluded from all competitions.



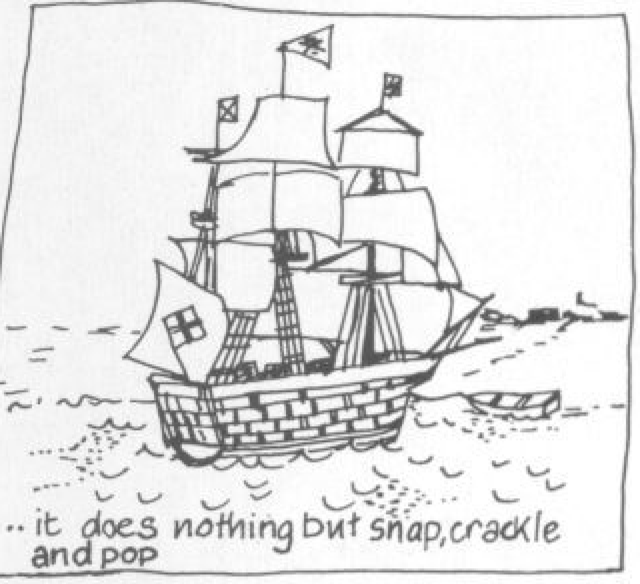
CLUES ACROSS

1 Forbidden fruits for Commodore Users? **(6)**
5 Peripheral subject to scrtiny **(6)**
10 Foreign body found in German Silicon (abbr) **(4)**
11 Nation a lot troubled when encoded **(10)**
12 Confused, so both compartments produced **(6)**
13 Profits from graphics starting with first class points **(5)**
15 Poor crime, cross about the CPU **(14)**
18 But they won't remedy a poor picture on your TV screen **(7,7)**
23 Assign in a rare ferrous compound **(5)**
26 Responds to a scare about the tapehead **(6)**
27 Justification for hey verification **(10)**
28 Initially, inquisitive computer operators never get the picture **(4)**
29 One who hits the keys too hard ... **(6)**
30 ... Possibly resulting in this **(6)**

CLUES DOWN

2 It might cause an impact when producing an impression **(7)**
3 Trouble at the golf course when forming a network **(5,2)**
4 Extremes about a computer manufacturer might be considered material **(5)**
6 Cowers when computers start to call points **(7)**
7 In France, normally normally uninteresting items begin to cause boredom **(5)**
8 Greater than or equal to **(2,4)**
9 Any gin? No? That's not very pleasing! **(8)**
14 He's supposed to be mean, but usually comes free! **(4)**
16 Artist identity resulting in hostile incursion **(4)**
17 Ratio not involving what happens in the disk drive **(8)**
19 Puts on display a spread **(7)**
20 Basic example of a shortened version **(7)**
21 Data transfer piling up **(7)**
22 They usually come in pairs and cause quite a spin **(6)**
24 Amend a field and put away **(5)**
25 Heartless blighter, kind of those with no vision **(5)**





Across

6 Merry
7 Disk drive
8 Tommy
9 Increment
10 Syntax error
14 Lair
15 GOSUB
16, 2dn REDO FROM START
17 Butterfield
20 Interrupt
22 Lapse
23 Adventure
24 Scone

Down

1 Memory map
2 see 16ac
3 Mien
4 Prime
5 event
11 reset
12 ordinance
13 idolising
18 snide
19 fever
21 part

CROSSWORD ENTRY FORM

Name: ....

Address: ....

....

....

Preference: Commodore User ☐ Vic Computing ☐

Size: ☐S ☐M ☐L ☐XL

Send to: Crossword, Commodore User
The Metropolitan, Enfield Road, London N1 5AZ

Learn to use your micro before it comes to this



HONEYFOLD

Don't suffer the indignity of learning from others when Dr Watson can help you teach yourself. His courses are a breakthrough in computer programming for the beginner and the not-so-beginner. Learning to write programs is now entertaining. Gone are the turgid manuals written for engineers. In their place are lively texts written by qualified computer teachers, with games programs as examples.



Each course contains a step-by-step, easy-to-follow text in paperback book form, supported by software on cassette. The cassette is loaded into your computer at the start of the course and provides all the major programs described in the text.

Dr Watson assembly language courses are the first real ones for beginners. They allow you to write programs in a manner that is logical and easy to read and understand.

They have a computer aided learning (CAL) tutor which explains binary BCD and hexadecimal. The mnemonics used are totally uniform throughout and the course is interspersed with numerous exercises and their solutions. A bonus is that a full assembler is included, and remains useful long after you have completed the course.

Dr Watson BASIC Courses teach you how to write programs in a form as near to plain English as possible. Courses are based on projects; each one gradually introducing new commands, so that by the end of the course you will have utilised the full vocabulary of the machine's BASIC.

All the courses come in a library-style folder for safe and easy storage. And are available from WH Smiths, Boots, Menzies and leading microcomputer multiples for just £14.95. (£11.95 for the CBM 64 Children's BASIC Adventure – Part 1.)

Dr Watson Computer Learning Series for Commodore micros
VIC 20 Beginners Assembly Language
PET 2/3/4/8000 Beginners Assembly Language
CBM64 Beginners Assembly Language

*New releases

*CBM64 Childrens BASIC Adventure – Part 1. (For children aged 7–97!)
*CBM64 Beginners BASIC (complete with 'Honey.Aid').
'Honey.Aid' is a toolkit/graphics/sound utility that adds 28 new commands to your CBM64 BASIC.

Honeyfold Software Limited
Standfast House
Bath Place, Barnet, Herts.
Tel: 01-441 4130

Before you buy a micro – make sure Dr Watson has the course.

Write away

This is your page: normally we write for you, but here we listen. Feel free to let us know what you think – about the magazine, about Commodore, about suppliers, about life, art, the meaning of existence or whatever. We don't print everything we receive, of course; but anything that might be of specific relevance or general interest will make it to these pages.

Technical matters get passed to Tommy for eventual emergence on the Tommy's Tips pages. But anything else ends up here. Address your comments, complaints, queries and congratulations to The Editor, Commodore User.

Hi-Res Update

I have noticed a number of printing errors in my **Hi-Res** program for **Commodore User** as follows:

- At the bottom of the first column there should be a space between the 'Y' and the colon.
- In the second column, the Hi-Res dimensions should read 0 to 151 and 159. To return to normal screen should be #COLOUR1,50:
- In the fourth column TX5 should be TX$ and the SYS call in line 10 should read SYS 4612. The two formulas at the bottom of the page syould be
  xx = AD − yy * 256
  ADDRESS = 32768 + 8 * SC
- I have found that the tenth line in column four doesn't always work and should be changed to
  10 VW=0:TX$=" ":SYS4612

L French 130 Jocelyns, Old Harlow, Essex.

You win some ...

After receiving the December issue of **Commodore User** and reading S J Poulter's letter and your reply, I feel compelled to write. I agree with a lot of what SJ says, although I did start computing on a 16K, (dare I say it) ZX81. I always enjoyed Vic Computing and would read it from cover to cover time and again; but now, since you decided (perhaps correctly) to incorporate the 64 rather than issue two magazines we Vic owner/users have been rather left out.

I too have no intention of renewing my subscription: as it is no longer useful to me as it covers the 64 to a far greater extent than the Vic-20 it was started for. Maybe you will have had letters from 64 owners against S J Poulter's letter and mine. But while I can understand that without advertisers you cannot survive, without subscribers you cannot anyway.

Would it not be possible to go back to **Vic Computing** and issue a '64 Computing' to the different groups? The advertisements could be put in both, with a little bit of editing by perhaps a new member of staff; after all, there are enough people free for such a position – about 3,000,000 at the last count, I believe.

David Shepherdson, 3 Tarn Villas, Cowpasture Road, Ilkley LS29 8RH, West Yorkshire.

Separate magazines for the Vic and 64? Well, maybe ... But (a) a lot of Vic owners will be moving on to the 64: and we think (b) there won't be many new Vic owners joining the fold after the middle of this year or thereabouts (certainly not in proportion to new 64 users): so (c) Vic owners will represent an ever-declining breed: and (d) the idea of a magazine like *Commodore User* is *not* to get fewer and fewer readers: so (e) if we were to do a 'Vic Computing' we'd be cutting our own throats.

Of course, that's the viewpoint of someone who has to run a company (albeit a small one) and keep the present handful of staff off the dole.

The other point of view is equally forceful, though: we *ought* to service our reader's needs. If you want a Vic-only magazine, let us know. We won't be able to sell many ads in it, so it will be smaller and possibly more expensive that Commodore User. But if we don't actually *lose* money on it, we'll certainly consider it – perhaps as a bi-monthly supplement to *Commodore User*? That would be easiest and cheapest for us.

Anyhow, let us know what you want. Would you pay say £1.25 a copy for a Vic-only magazine?

Rabbit, Rabbit

I notice in the August issue of **Vic Computing** that a short reply was given to a letter in which it was mentioned that a review copy of *Rabbit Writer* had been requested but none received. The following story might explain why they didn't supply one.

In July last year I went to Harrow and while there I bought a copy of *Rabbit Writer* from Rabbit Software (also known as Cream Computers Ltd. They both have the same address).

When I tried it out it was very slow in use. The average typist would have no trouble in entering text faster than the program could process them, thus causing complete gibberish to appear on the screen. Although to be fair to Rabbit Software, they do admit it is slow and ask the user not to enter text too fast!

But the really annoying part is that the program constantly crashes. For some unknown reason, before saving the text on tape it goes through a coding routine which takes up to five minutes depending on the length of text. While in this part of the program it keeps stopping with an 'illegal quantity error' in line 8500. It does this in about 80 per cent of text savings – and *always* if I have inserted a line in the text.

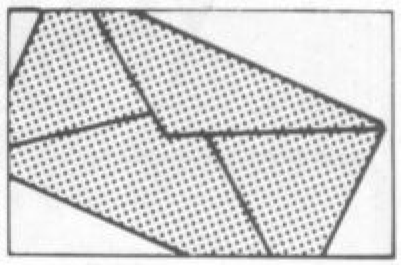
Rabbit has ignored all my letters on the subject and refuses to answer any questions over the 'phone. So the reason that you didn't receive a review copy of *Rabbit Writer* is because it has this nasty bug. One which they will not acknowledge or discuss.

Incidentally, I am looking forward to the new mag. I can now hover around my letter box twelve times a year instead of six!

Vic Barton, 7 Birds Close, Welwyn Garden City, Herts AL7 4AR.

It is our policy to try to get hassles sorted out – or at least give the supplier chance to comment. Otherwise we might be unfairly criticising from an isolated instance. So we invited Rabbit to comment.

As yet we haven't had any reply at all.



Sometimes you can't win

Re: The Over Command (**Commodore User** Oct 1983): well done guys! You've managed to make your first big blunder of the magazine!

"Revelation", eh? New "hidden command", eh? Wrong! Look at the program, the only reason line 60 rubs out (draws over) is that the Vic is interpreting "OVER2" as a variable name. Not having been previously defined, it is given a value of 0 and hence draws in the screen colour "rubbing out" the line.

Add the line below and then see how new a command it is:

5 OVER2 = 2

This means that the other commands mentioned – PAINTOVER (which would have been very useful) CIRCLEOVER, etc – are also erroneous (pity!).

Apart from this (and having a book review in the contents and not in the magazine itself) congratulations on an excellent, value for money, *quality* production.

Peter M Bartley, Ushaw College, Durham DH7 9RH

Letters

Flying blind?

I purchased a copy of Victay's *747 Pilot* for my Vic-20 after seeing the ad in your magazine. I am sorry to say that I am very disappointed with the simulator, so much so that I returned it asking for a refund.

This was refused on the grounds that more than seven days had passed. I wrote again asking for a number of questions about the program to be answered and that I insisted my money be refunded. The cassette was returned with a refusal to refund my money and the statement that "if I return the cassette again it will be disposed of". I was also "invited to do better" which is an attitude one hardly expects from a software company.

The ad claims that the 'simulator' is highly addictive and uses Vic graphics, sound and colour to the full. Nothing could be further from the truth. The graphics could easily be done without the Super Expander; the sound is barely audible and does not change with the power setting as one would expect.

As for being 'highly addictive' it is one big yawn. Having taken off there are no instructions as to which heading to take, how far to fly, or for how long. Without a definite course to follow the whole thing is completely pointless. One point is that it is possible to taxi along the runway for over 9,000 miles without hitting anything!!

I would be grateful if you could take a serious look at the offerings of this software house. This kind of rubbish does no good to their trade and makes one very wary of buying from such adverts. Your attention and comments on this would be greatly appreciated.

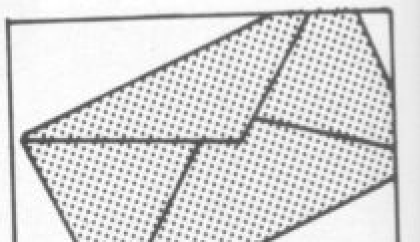
J. Farrar, "Elm Cottage", 2 Marsh Lane, Hayle, Cornwall TR27 4PS.

Chocks away

The letter you sent me originated from an early customer; Mr J. Farrar purchased *747-Pilot* on 7 June 1983 and returned the program on 21 July, some six weeks later. I did not consider a refund to be reasonable after such a long delay and returned the cassette.

Mr Farrar returned the cassette a second time on the 10 August with a second request for a refund and a list of queries, such as;

- what does Mach number mean?
- why no retractable wheels?
- why no runway display?
- why does the sound level not vary?



I replied that *747-Pilot* is a highly compressed Basic program based on Boeing airframe and Rolls Royce engine data. The program completely fills the Vic-20's memory and gives a good approximation to the general handling characteristics of the 747; but the limited memory of the Vic does not permit the many additional features which could readily be added on a larger machine, such as the Spectrum.

Indeed the aircraft will only take off if you pull back on the joystick – just like the real thing. Alas, memory prevented the addition of a simple routine to give a crash after say two miles of runway. But there *is* a crash routine if you hit the ground with a vertical speed greater than 600ft per sec. And the sound *does* cut out if you run out of fuel. Unfortunately there is no geography, but the aircraft heading does change correctly as the aircraft banks.

In summary, Mr Farrar expected a *Flight Simulator*. They cost a million pounds! I advertise a *flying simulation* which is technically a good approximation (but limited by the Vic-20 memory) for only £6.99.

I would challenge Mr Farrar to do the hi-res graphics within the required time (one complete cycle per second of all the program calculations plus display) on an unexpanded Vic. If he or any other purchaser of *747 Pilot* can produce an exact equivalent of my program I shall be delighted to purchase it from the first to do so outright (full rights) for £100!

I consider Mr Farrar's letter to you to be highly misleading (no mention of the six weeks delay) and erroneous (he quotes a 'simulator' – he should read the advert again). His final paragraph in particular is offensive, and I shall be most disappointed if you choose to print it. If you do print Mr Farrar's letter, I hope you will also print my reply.

A.J. Grant, VICTAY, 12 Leahill Close, Malvern WR14 2UE

PS. Thank you for the opportunity to comment which I greatly appreciate.

BUSINESS ELECTRONICS LTD.

'The Microcomputer Specialists'

ROWNHAMS HOUSE, ROWNHAMS, SOUTHAMPTON SO1 8AH
TEL: SOUTHAMPTON (0703) 738248/739092 (Sales)

for

CBM 64 ★ 700 ★ BBC MICRO ★ APPLE ★ SIRIUS

Also Micro-Magic in the Basement of Plummers

Above Bar, SOUTHAMPTON Telephone 0703-25903

South Wales Software

Choose from a range of over 300 games for the 64 and 200 for the Vic-20!

– send large sae for FREE LIST (state machine)

to:

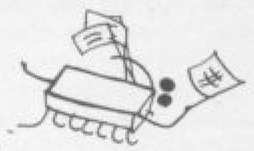
South Wales Software
Freepost, Clynderwen, Dyfed SA66 7BR

USER FRIENDLY MACHINE LANGUAGE

A = 42
X = 0
£A
MX = A 7680
MX = A 38400
X+
IF#£A
RTN
GOTO £A

GET PLOT ?A SA LO VE LI RU

Tape for any Vic-20 with jargon free introduction to machine programming



Cheque P/O **£12**
SYD PIDD, ALNE, YORK, Y062 2LQ

Sumlock

MANCHESTER.

Commodore appointed VIC 20 dealer.
Permanent showroom-shop display.
Hardware-Software-Accessories.
Books-Service-Maintenance.

Personal computers with Personal service.

198 DEANSGATE, MANCHESTER.
TELEPHONE 061 834 4233

Sherborne Designs

Dust Covers

Durable quality covers in a soft p.v.c. with cotton binding

Vic-20/Commodore 64	£2.95
Cassette State old or new	£1.95
★Pet 4000/8000 Computer	£4.95
★Pet 8096 SK System	£6.95
Vic single Disk Drive	£2.95
Printers/526/1625/1525	£2.95
★Pet Dual Disk Drive	£3.95
Specials made to order	
Vic Carrying Case	£15

Prices include P&P and V.A.T.

"Victory House", 8A, The Rank, North Bradley, Trowbridge, Wilts. BA14 9RP Tel: (02214) 4425

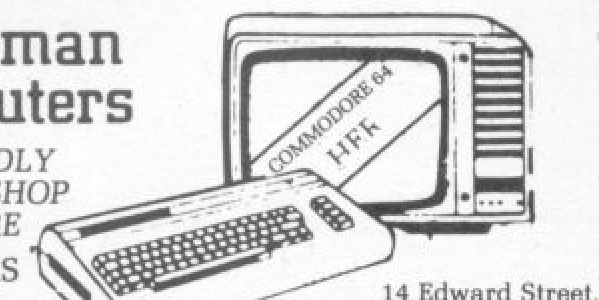
Specialists in microcomputers
Hardware & Software, systems &
programming, Equipment Rental

MICRO FACILITIES

Micro Facilities Ltd. 7-9 Church Road,
Egham, Surrey TW20 9QL Tel: Egham (0784

Everyman Computers

YOUR FRIENDLY COMPUTER SHOP IN WILTSHIRE



VIC PRINTERS
DISC DRIVES
SOFTWARE -
DUST COVERS
BOOKS, CARTRIDGES

14 Edward Street,
Westbury, Wilts
BA13 3BD

(0373) 864644

Commodore 64-THE BEST VALUE ON THE MARKET

PPM LIMITED...

For all your Business Computer and Software requirements.

We offer excellent after sales support including a team of experienced service engineers.

To discuss your application contact:
04867 80111

Hermitage Road, St Johns, Woking, Surrey GU21 1TZ
Telex: 850181

fbc DERBY

CBM64 AND VIC20 DEALERS

We have the largest selection of hardware, software and books in the area.

FIRST BYTE COMPUTERS,
10 MAIN CENTRE,
LONDON ROAD, DERBY.
TEL: 0332 365280

Y-E-S Vic 20 & 64

SALES & SERVICE

COMPUTERS

SAY YES FOR COMMODORE HARDWARE, SOFTWARE & PERIPHERALS

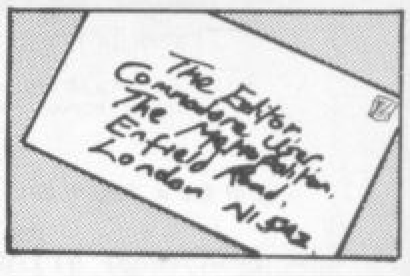
YORKSHIRE
ELECTRONICS
SERVICES
LIMITED

Caxton House,
17, Fountain Street,
Morley, West Yorkshire
Tel: 0532-522181

Classified

STAY FRIDAY TO SUNDAY at one of Worcestershire's finest Hotels and learn "Basic" on Commodore 64s. All rooms have bath, colour TV, etc. 14 hours of instruction from a qualified lecturer, maximum of 20 people on each course. 10 computers. Cost £65.00 fully inclusive. Write for brochure to: Gainsborough House Hotel, Bewdley Hill, Kidderminster. Tel: 0562 754041.

Unexpanded Vic 20. "Invader Numbers". Teaches children 2-6, numerical keys, counting, addition, subtraction. + Expander, analogue clock. Both inc p&p £5.00. S Belshaw, 11 Station Road, Lundwood, Barnsley S71 5LA.



BORED WITH YOUR VIC SOFTWARE? If so, why not exchange it via our club. For details, send sae to **Mavac Enterprises,** 101A Underdale Road, Shrewsbury.

747 PILOT by Victay. Exciting new flying simulation for the 747 Jumbo Jet. Runs on Vic-20 with Super Expander Cartridge and Joystick. High resolution display of aircraft altitude and angle of bank, numerical readout of speed, Mach number, engine thrust, fuel, flaps, height, vertical speed, course, miles covered and elapsed time. Take off, climb, cruise, descend and land! Highly addictive, using graphics, colour, sound and function keys. Cassette £6.99 from Victay, Dept. C.U., 12 Leahill Close, Malvern WR14 2UE.

Ad Index

Commodore User is published twelve times a year by the Paradox Group, The Metropolitan, Enfield Road, London N1 5AZ.
Subscriptions and back issues are handled by B.K.T. Subscription Services, Dowgate Works, Douglas Works, Douglas Road, Tonbridge, Kent TN9 2TS; Telephone 0732-351216
Annual Subscription (UK) £12.00, (Eire) £IRL17.00, (EUROPE) £18.00, (REST OF WORLD) £32.00.

Cheques and postal orders should be made payable to **Vic Computing Ltd.**

Printed by Garrod & Lofthouse Ltd, Crawley; Phototypesetting by Carlinpoint Ltd, London WC2 and PDQ, London N10; Reproduction by Elan Litho Ltd, London EC2.

Material is accepted on an 'all rights' basis unless otherwise agreed. Enclose SAE if you want the return of original manuscripts and photographs.

Please do not send listings; we only accept programs in cassette form.

ISSN 0265-721X